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BEEF CATTLE PRICES END CLIMB IN '59

Prices of beef cattle seem to have ended a long upward climb in 1959. The 1959 yearly average for Choice steers at Chicago was close to $28.00 a hundred pounds; 25 percent above the low year, 1956, and the highest in seven years.

Turning point in cattle prices apparently came last April. After the April high of $30.33 a hundred for Choice steers at Chicago, prices began what may be a considerable decline. Lower prices are expected because ranchers and farmers have been accumulating cattle for 30 months. A large share of this accumulation consists of steers, heifers and calves being fattened and grown for slaughter.

The number of cattle on feed last October 1 was officially estimated at 20 percent above the year before. It was not until recent weeks, however, that market receipts began to exceed year-before runs. At about the same time, mid-November, prices of choice steers slipped under year-before levels.

We have said that prices of beef cattle might average $2.00 lower in 1960 than in 1959. But this is a guess. There is no way of knowing how many cattle farmers will sell. Odds are against price recovery this winter. Too many farmers may be heading cattle for the late winter, expecting the high prices of the past two years to be repeated. And many ranchers have too many cattle to feed through the entire winter season.

L. H. Simerl in Illinois Farmer's Outlook Letter

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The Farmer's Digest

Volume 23 February, 1960 Number 8

Does Fertilizer Harm The Soil?

Have you heard this question? The author gives the answer . . .

Condensed from Plant Food Review

Jonathan Garst, Agricultural Consultant

THERE is a persistent undertone of fear of chemical fertilizer in some quarters.

This is not surprising since farming has a history of thousands of years, while the history of chemically processed fertilizer can only be counted in scores of years in most of the United States, and not much more than 100 years anywhere in the world.

It is 300 years since Van Helmont, the Belgian, showed that practically the entire weight of a growing plant comes from sunshine, water and the carbon dioxide of the air. It still is hard to believe that a 100-bushel corn crop extracts less than 400 pounds of dissolved nutrients from the 10,000 tons of soil in the corn root zone.

So the man who adds a few hundred pounds of chemicals to an acre of old Mother Earth, although he may be feeding the crop all it takes out of the soil, cannot expect, even today, to be universally accepted as an honest, hardworking, God-fearing farmer. It looks as though his chemicals are some kind of a stimulant, like a whiskey, instead of plain bread and butter.

However, people like to eat and the people of the United States would certainly not be eating as well without the aid of chemical fertilizer. Credit for more than one-third of our present total crop production must go to commercial fertilizer. Our surpluses, which cause so much trouble, account for less than 10 percent of total production.

Can we continue to pour

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chemicals into the ground and expect to go on getting good, healthy, and health-giving crops?

Healthy Hollanders

Let us dispose of the health-giving item first. For example, the most concentrated use of commercial fertilizer in the world is in Holland. On the average, Hollanders live longer than any other people. A child in Holland can now count on living to be 72 years old, as compared with an average life expectancy of less than 70 years in the United States. This certainly indicates that food grown with chemical fertilizer cannot be very harmful.

But how about dear old Mother Earth? Can she stand it? Well, there is one place in the world where we have more than 100 years of records on chemical fertilizer versus good old barnyard manure. This is at the Rothamsted Experiment Station, 25 miles north of London, England. The Rothamsted farm was the home of John Lawes. In 1842 Lawes patented the use of sulphuric acid on raw rock phosphate to make superphosphate. He hired Joseph Gilbert as a chemist. They started field experiments on fertilizer, and the two of them kept at it until 1900.

Rothamsted had been farmed a long time before this. The Manor House in which Lawes was born was built some time before the year 1200. In other words, the oldest part of this house was built nearly as many years before Columbus sailed as there have been years since he sailed. What's more, the farm was old, ancient and hoary when this house was built. Roman relics from about the year 100 have been found on the place. Chemical fertilization, which started here, certainly is not very old by comparison.

Lawes and Gilbert laid out some 50 acres in experimental fields in 1843, and they are still there. The most famous is the Broadbalk field of eleven acres which has been continuously planted to wheat.

Using high energy feed formulas, it is possible to produce a broiler weighing more than three pounds in eight weeks on less than six pounds of feed. This is possible if no disease outbreaks occur, if the chick is capable of obtaining such standards and if proper management is followed.

This field was divided into strips. On one, all grain and straw have been taken off each year, and nothing in the line of fertilizer added. This strip has a 100-year average yield of about 12 bushels to the acre. On another strip, only minerals have

been used — phosphate, potash, sulphur and, surprisingly, sodium and magnesium. The addition of minerals alone brought the 100-year average yield up to 14 bushels per acre. On a third strip, they applied nitrogen alone, at the rate of 86 pounds per acre in the form of ammonium sulphate. The average yield on this strip has been 20 bushels.

When minerals were added, along with the 86 pounds of nitrogen, the 100-year average yield jumped to 30 bushels per acre. Increasing the nitrogen rate to 129 pounds, plus minerals, pushed the average yield up to 34 bushels.

Finally, on the sixth strip, 14 tons per acre of barnyard manure has been applied every year for 100 years. The average yield on this strip has been 32 bushels per acre.

This does not mean that the chemical fertilizer was better than the very heavy dressings of barnyard manure, but there are factors other than fertility in production when one crop is grown continuously for a hundred years. For example, weeds gave more trouble on the manured strip. In any case, the Broadbalk field proves that, even on very old farmland, chemical fertilizer can be added to the soil in sufficient quantities for optimum fertility for at least 100 years without harmful effects.

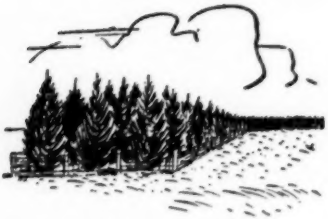
This is reassuring information. The world's increasing population cannot be fed with 12-bushel crops. Barnyard manure is not available for many acres, and in any case this only recirculates some of the fertility taken from the soil. Chemically processed minerals and nitrogen fixed from the air are already the source of a large part of our food. In some European countries they account for more than half of the production. Within a generation chemical fertilizer will be the major source of food for the world.

Anger is like a stone cast into a wasp's nest.

A couple of Montanans are reported to be collecting the noseprints of cattle in support of their theory that such are as individualistic as are fingerprints in humans. They figure it would be a great boon to the herd owner to have his herd "noseprinted." With these prints, it would be easy to identify strays, mavericks, and calfnapped bovines. It's not difficult to take the prints, they say. Ink the calf's nose, then roll same over smooth paper. And presto! A sure-fire catch-thief weapon!

—*News Popper*

Small Forests: Will They Pay?



Here are short and long-range prospects for the small forest . . .

Condensed from Farm Business Service

THERE never was a better time to make a small forest pay.

That's the first answer nearly every private and government forester gives those who ask about opportunities in woodland. But the big question is whether timber prices will still be favorable when *your* trees are ready to sell.

Timber is scarce in almost every part of the world. High quality timber supplies are particularly short, and forestry experts say the situation will become *even tighter during the next* 10 *to* 20 *years.*

Trees grow slowly but population is soaring and average incomes are rising. The need for new houses and other timber uses is increasing rapidly. Economists predict the demand for timber will *double by the year* 2000. Tree prices should be favorable at least that long, likely much longer.

Improving Woodland

State and USDA stuides show the average farm woodlot could return *two to three times as much income* with proper management.

Your goal should be to sell the maximum in number of trees and degree of quality. That takes proper thinning, pruning, replanting, disease and insect control, marketing and fire protection.

Because woodlands differ widely in so many ways, you should follow the advice of a professional forester.

Plant trees on your land? That depends on the kind of land and the alternatives available. It's often the *best way to make a profit on poor land.* Trees generally should *not* be planted on level land fertile enough to grow good cultivated crops without eroding or on land that can provide needed pasture.

However, there are many spots within good land, such as gulleys, hard-to-work corners and windbreak areas, that should be planted to trees. An excellent ex-

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ample is Christmas trees that can convert normally unproductive land into high-cash returns in 5 *to* 10 *years.*

Big drawback in planting most trees is that it takes 12 to 20 years in the South and longer in the North before cash returns start coming in. But you can *measure benefits* like wind and erosion control and land value increases almost immediately.

Christmas trees present an excellent opportunity for many farmers to make *profits in a relatively short time.* About 45 million trees will be sold in the U. S. during the Christmas season each year.

There's a definite *shortage of high grade Christmas trees,* the kind a farmer can produce with some extra care. Many farmers market a $300 to $400 per acre crop each year. And most of the handling comes during the "off" season. Some farmers harvest Christmas trees continuously, others aim toward a crop of other forest products.

What's woodland worth? It depends, of course, on what condition it's in, how much net income the wood products will bring and how long it can be expected to continue that yield. The interest you pay on borrowed money, or the interest your money would draw in other investments, also determines what you can afford to pay.

This guide (below) worked up by USDA economists tells you about how much you can pay per acre for *each dollar* of annual net income at various interest rates and forest life expectancies. For example, if you have to pay 5% interest on money for woodland that's expected to bring an annual $1 *net* income for 30 years, you could pay $15.37 per acre. But if you expect an annual net income of $5 for 30 years, you could pay $76.85 per acre (5 x $15.37).

Years	3%	3½%	4%	5%
20	$14.88	$14.21	$13.59	$12.46
30	$19.69	$18.39	$17.29	$15.37
50	$25.73	$23.46	$21.48	$18.26
Cont.	$33.33	$28.57	$25.00	$20.00

Consider, too, that tree land is a good hedge against inflation. The value of good timberland increases faster than bare land. You may also get capital gains *tax benefits* at the same "half-rate" as on stocks and bonds. And wood sales can easily be shifted from one year to another for tax purposes.

Government aid to the small woodland owner comes through furnishing technical advice and planting stock and through sharing forestry work costs.

● *Technical advice.* Your county agent or ASC committee knows the local forester who is technically-trained to give *free*

on-the-farm recommendations for the *most profitable* type of product, selection of trees for cutting, sales practices, improvement of remaining stand, etc. If your tract is large and presents a complex problem, he may advise you to hire a private forester.

● *Furnishing seedlings.* If you want planting stock at low cost, write to your state forester and describe the land you want to plant. He'll advise you on planting methods and send an order blank for seedlings which you buy from your state nursery at nominal cost.

● *Cost-sharing.* The federal government pays 50% to 80% of the cost of establishing forests on land placed in the conservation reserve. You can't harvest a crop from the land for 10 years, but the government pays you annual "rent" during that time. Under another program, the ACP service, the government pays about 50% of the cost of improving your woodland, but pays no annual rent. Work it out with your county ASC committee.

● *Publications.* Your county agent, soil conservation office, state extension department and the USDA have excellent bulletins, mostly free, to help you build or improve your woodland. *Good place to start* is with Farmers' Bulletin No. 1989, entitled "Managing the Small Forest." Write USDA, Washington 25, D. C., for a free copy.

Selling forest products: Too many men sell to the first buyer who offers them a lump sum for their timber as it stands in the woods. Such sales are usually unprofitable, unless you know what you *really* have to sell, both in amount and kind of trees. Note these typical examples:

In Kentucky, an owner was offered $7000 for 310 trees picked by the buyer. After consulting a farm forester, the owner received $12,600 for 199 trees!

The advice of a forester increased a Tennessee woodlot owner's income from $1800 to $5000. An Iowa farmer had his woodlot income more than tripled. In each case, trees were selected to assure a more profitable long-term growth on the remaining stand.

Figure closely the difference between the price on trees on the stump and the converted product. Most small forest owners increase their profits by harvesting the timber themselves.

Get prices from as many sawmills and wood-using industries as possible. Advertising in local newspapers helps. Check out purchasers in advance to avoid slow payment, costly collections and probable losses. Use a written sales contract, particularly if cutting is done by the buyer.

Hay Wafer Machines — When?

Some manufacturers are trying and testing models now . . .

Condensed from Western Crops and Farm Management

Aaron Dudley

WHEN will there be an efficient hay wafering machine that can pull into your field, start down a windrow and punch out wafers at the rate of 4 or 5 tons an hour?

The answer: Right now.

But there are reservations in this answer. The machine is built — several of them. But, with exception of the Albers Foragizer, they are not yet in commercial production.

Two leading equipment manufacturers — International Harvester and Ford — are back in their experimental labs with their mobile field wafering problems after testing them out in California fields. We watched some of these tests, inspected the machines, saw them operating in the fields in 110 degree heat. They're designed to do a job. It is our guess that they aren't far away from commercial production. However, there are bugs still to be worked out.

Long Tests

International Harvester rolled a slick-looking wafer machine into Blythe, California, last summer. A twin machine reportedly has undergone rigorous field tests in other areas, emerging with an impressive 5-ton per hour production record.

While the IH machine was being put through its paces in fields along the Colorado River, Ford Motor Co. shipped its experimental mobile field waferizer west, too. The Ford machine went to experimental alfalfa fields on the Davis campus of University of California. The machines, strikingly similar in many features, were both moved and tested under considerable secrecy.

Both are tractor-drawn. They are mounted on a pneumatic-

Reprinted by permission from Western Crops and Farm Management, 4511 Produce Plaza, Los Angeles 58, California

tired single axle. Powered with gasoline engines, they employ conventional pick-up attachments. The hay is augered to a chamber and packed into wafers by piston action. Both have heavy fly-wheels — the Ford machine, one; III, two.

100 HP

The IH machine reportedly has 100 hp under the hood. Those belt-driven dual fly-wheels look like they must weigh at least 800 lb. each. It is our estimate that they rev up to 500 or 600 rpm — possibly more. The rig must weigh in the neighborhood of 8,000 lb.

It is a thrill to see this compact machine pull into an alfalfa field and start punching out wafers. Hay in the first test field had been cut a scant 24 hours. There had been some recent rains and humidity was high. Actually, all technicians witnessing the test run agreed that moisture content in the hay was too high for either baling or wafering. Baling operations in the field had been stopped earlier in the day due to high moisture content of the curing alfalfa. But, in spite of the high moisture, the machine churned out a lot of wafers, literally squeezing the water out of them as it forced them through a curved rigid tubular track into a big flexible pipe and back into the trailing wagon. It was a tandem hitch, with a wheel tractor towing the wafering machine and the wagon hitched to the machine.

No Records

Efforts were made to compile production data, but high moisture content of the hay created problems that would unfairly distort the record. These early tests were all that we personally witnessed, but subsequent trials reportedly produced encouraging results.

The wafers are 4 inches in diameter and usually emerge from the machine about 2 inches in thickness. Density depends to some degree upon condition of the alfalfa and adjustment of the machine; however, those wafers we inspected were moderately dense. They were of considerably less density than those produced by the heavier, stationary-type machines. However, they were of greater density than those made by earlier models of the IH machine.

The new cars have four speeds — first, second, third, and you'll be sorry.

Alfalfa used in the tests was cut with a swather. It was not crimped. Tendency of the hay to congest in the packing chamber gave a burned effect to some of

the wafers, but subsequent trials indicated that hay of lower moisture content eliminated this problem.

Enthusiasm

The IH wafers generated a lot of enthusiasm. Producers liked the idea, design of the machine and the promise it held for a speedy method of packaging hay in an easy-to-handle form. Cattle feeders liked it as a form of feeding roughage. It was pointed out by cattle operators in the area that the wafers could be quickly, easily and cheaply transported direct from field to mill. At the mill it could be elevated, augered, dumped or handled in bulk form much the same as grain or silage is handled. It was a system of handling that greatly appealed to both alfalfa producers and stockmen.

The doorstep to the temple of wisdom is knowledge of our own ignorance.

During the trials, the wafers were transported in the same wagons used for cotton. Wafers were either dumped directly into feeding troughs or hauled to mills for grinding and blending into a balanced livestock ration. Elimination of hand labor was considered the big factor favoring this type of hay processing.

Well-Designed

The Ford machine is another compact unit. Like the IH machine, it creates the definite feeling that the designers knew what they were doing. Obviously, a great deal of research and engineering know-how has been put into both machines. And when you look at them you get the feeling that this is the mobile wafering break-through — that these machines are getting pretty close to your equipment dealer's show room. Maybe not, but it appeared that way to us.

The Ford wafer is an entirely different shape from that of other wafering products. It is 3 inches square and a scant inch thick, with convex top and an appearance of being sheared off at an angle on two edges.

Engine of the Ford rig is mounted different from the IH machine, with what appears to be direct-gear connection to the compress area.

Problems Cited

"When all the cards have been turned up," Clarence B. Richey, chief research engineer of the Tractor and Implement Division of Ford Motor Co., said, "it appears likely that the story of the development of the hay pelleter will rank as one of the most fascinating in an industry which has a tradition of fascinating development stories dating back to

beginnings of the reaper about 150 years ago.

"The handling advantages of converting long hay in the windrow into pellets with a bulk density two to three times that of bales are fairly obvious."

The forces involved in pelleting hay are much higher than those usually encountered in farm machines. With a reciprocating plunger machine making a 4-inch disc, a force of 50,000 lb. is required at 4,000 lb. per square inch, the pressure needed for stable pellets. This compares with a force of about 10,000 lb. for a conventional baler with a 14 x 18-inch chamber baling alfalfa hay.

"It is obvious that severe mechanical problems are encountered when loads are roughly five times and plunger speeds 4½ times that of balers," concluded engineer Richey.

Is This It?

Whether or not Richey and his associates have surmounted these problems in the new machine they have been testing is a question that only they can answer. The answer probably will not come until Ford Motor Co. is ready to go into production on a wafering machine.

There may be some significance in the fact that engineers for several companies, including Ford, are working at a fever pitch to smooth out their field wafering machines. There's significance, too, in the fact that it was just a little less than a year ago that Clarence Ritchie hazarded the prediction that a fast, efficient, practical mobile field pelleting or wafering machine would be perfected "within the next two years."

The most successful man is the man who holds onto the old just as long as it is good and grabs the new just as soon as it is better.

The world's oldest co-op started in Rochdale, England in 1844, with 28 members and $67 capital. Its original stock was 28 pounds of butter, six bags of flour, one bag of oatmeal, 56 pounds of sugar, and 24 tallow candles.

Today Rochdale Pioneer Cooperative has 93 branch stores and owns a bakery that turns out 12,000 loaves of bread each hour. It has about 40,000 members and distributes patronage dividends of about $250,000 a year.

Who'll Gain From More Livestock?

Farm family incomes may drop substantially as the result of increased livestock production . . .

Condensed from Iowa Farm Science

Gene Futrell and Arnold Paulsen,
Iowa State College

LIVESTOCK and poultry production is expected to increase sharply over the next several years.

Feed grain supplies are large, and grain prices will be lower. And as livestock numbers increase, livestock prices at the farm level are going to drop sharply. The over-all effect: lower incomes for producers and lower prices for consumers — but not in the same degree or in the proportions you might expect.

How will a sharply increased livestock supply affect an individual family food budget and a farm family's income? This is what we're going to try to show in this article. The estimates used are based on many assumptions and are *not* predictions of actual prices and incomes. But they're based on known relationships and are realistic enough to indicate the relative benefits and consequences of any widespread increase in livestock supplies.

Projections have been made before for "all consumers" or for "all agriculture." We're trying here to put our estimates in terms of an individual consuming and producing family to outline the probable situation over the next 2 or 3 years.

For Consumers . . .

Beef, pork, eggs, chicken and milk are the main food items produced in the Midwest. They make up about 45 percent of a typical family food budget. The estimated 1959 consumption of these products per person and for a family of four are shown below.

TABLE 1. Yearly consumption per person and total consumption for a family of four of selected foods.

Food	Per-person consumption 1959*	Estimated consumption for family of four
Eggs	353	1,412
Pork, lbs.	66.5	266
Chicken, lbs.	30	120
Beef, lbs.	80	320
Milk, qts.	175	700

*Estimated; Agricultural Marketing Service, USDA.

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

The per-person rates for the current year were estimated by the USDA. They're likely to change somewhat over the next several years. Increases are probable on some of the items that will be in large supply.

Most people in the United States, however, aren't anxious to eat more food. They are interested in reducing their food bill. Therefore, we've tried to estimate the possible reduction in the food bill for a family of four who do *not* eat more food in total.

How much difference will lower farm prices make in the food bill? Probably not as much as either consumers or farmers think it should. The amount of the retail price decline resulting from a farm price decline will depend on how much the costs of processing and handling food products from farm to grocery cart increase in the next several years.

If the pay to handlers, processors and distributors (marketing margins) would remain constant in cents per pound at 1958 levels, the typical urban family food bill for beef, pork, chicken, eggs and milk would be likely to drop about 4½ percent from 1959 to 1960. It would continue to drop to nearly a 6-percent decrease by 1962, based on long-range production estimates and price fore-casts for farm products.

But if the marketing margins continue to rise about the same as they have in the past 10 years, typical family food bills would decrease only around 3½ percent from 1959 to 1960 and would be down only about 2¾ percent by 1962.

Generally, the costs of handling food items change rather slowly in the short run. But they have increased for most items over the past 7-10 years. Of the items considered here, marketing margins for beef, pork and milk have shown a steady upward trend. Little trend has been apparent for eggs and chickens.

The decrease in retail food costs just mentioned is for items with a relatively "high farm value" — those items for which the farm-retail spread is relatively small. The farm-retail spread is the difference between the farm value and the retail price. It is the sum of such costs as spoilage, shrinkage, processing, hauling, displaying, handling and packaging.

Meat and eggs have a fairly high proportion of their total consumer costs in farm value. Farm producers in 1958 received about 67 percent of the retail cost of eggs and about 57 percent of the retail cost of pork.

Wheat, in contrast, is a low farm value crop. The value of the wheat in a loaf of bread cost-

ing 22 cents is only about 3½ cents. So, even if wheat were free, the consumer cost for bread wouldn't drop more than 16 percent.

But livestock products are in a better position than wheat as far as the consumer is concerned. When the farm value of meat, milk and eggs drops because of increased supplies, the consumer may still get the benefit of a substantially lower retail price. Unfortunately for the farm producer, however, the price drop must be greater in proportion than the change in the supply. Urban families will buy enough more livestock products to eat up an increased supply, but meat would have to look like a real bargain.

For Producers . . .

We've just outlined how consumers stand to gain — though not greatly — from the prospects for increased livestock production over the next several years. What will be the counterpart effects on the income of a typical farm family during the same period?

The total number of hogs to be marketed in 1960 may be as much as 22 percent greater than the 1958 slaughter. This would be the picture if the 1960 spring pig crop is increased by roughly 5 percent over 1959. If so, hog prices will decline by about 37 percent from the 1958 level. The reason for the more-than-proportional drop in prices is because of consumer behavior. Other farm prices are expected to decline also during the next several years. And some production costs are expected to increase, though the anticipated decline in corn prices will reduce the cost of purchased feed grains.

Table 2 shows the average income and expenses for a typical corn-hog farm in 1958. Both the income and expenses for the 1958 output are then projected for each of the years 1960-62 on the

TABLE 2. Projected income for a typical corn-hog farm.*

	1958	1959	1960	1961	1962
No. of hogs produced	383	383	383	383	383
Value of hogs	$15,325	$12,120	$ 9,700	$10,500	$11,300
Value of grain sold	3,237	2,900	2,757	2,545	2,490
Other income	4,556	4,532	4,364	4,211	4,063
Total Income	$23,118	$19,552	$16,821	$17,256	$17,853
Operating expense	$ 4,508	$ 4,598	$ 4,688	$ 4,778	$ 4,868
Fixed expenses	2,616	2,616	2,616	2,616	2,616
Feed bought	7,188	6,700	6,470	6,225	6,080
Total expenses	$14,312	$13,914	$13,774	$13,619	$13,564
NET INCOME	$ 8,806	$ 5,638	$ 3,047	$ 3,637	$ 4,289

*Assuming that output remains at the 1958 level on the farm.

basis of current production prospects.

Right off, the 383 hogs produced are reduced in value by 37 percent from 1958 to 1960. Total farm income might drop only about 28 percent, however, since the prices of other products aren't expected to decline as much as those for hogs. The net income — the return to all labor, land and capital used on the farm — might drop by 65 percent, or to about a third of its 1958 level.

Why doesn't the operator of this "typical" farm increase his hog production? The typical corn-hog producer probably will. But we held his hog production constant to illustrate a point: To show that the consumer, in the face of current prospects, stands to gain a reduction (but only a slight one) in his food budget — if he eats the same amount. But the producer — if he produces the same amount — in the face of current prospects may suffer a two-thirds decline in income.

The more one has to do the more he is able to accomplish.

Individual farm families could avoid part of this decline in income by cutting some costs, making timely marketings, changing the farm organization, enlarging the farm or increasing hog production. Many will increase their output and sales. But the total result of large numbers doing this and increasing production would be to force hog prices even lower.

All In All . . .

We want to emphasize again that the projections aren't predictions of actual costs, prices or income levels. They're intended to illustrate the probable relative effects on farm family incomes and on individual family food bills from the prospective increased farm output. And it appears that the consequences of large livestock-poultry-dairy production will fall heavily on producers through reduced individual net farm incomes.

Consumers in total could benefit considerably from the expected lower farm prices — particularly for the commodities discussed whose retail price includes a fairly high "farm value." But further increases in marketing costs — and these are likely — would eliminate much of the potential saving even on an "all consumers" basis.

The total value of the nation's livestock production might be reduced by 800 million dollars from 1958 to 1960. This is a potential saving for consumers in total and a reduction in net income to farmers. Since there are roughly

23 times as many consumers as farmers, however, the loss per farmer would be much greater than the savings per consumer.

Taken all together, individual farm family incomes may drop substantially as the result of lower farm prices following the increased production in prospect for the next several years. Reductions in individual family food bills, on the other hand, will probably be slight.

Develop Test For Measuring SNF In Milk

Dairy scientists at the Michigan Agricultural Experiment Station have developed a technique for determining the solids-not-fat (SNF) content of milk from a drop of milk.

The method is based on how fast a drop of milk passes through a liquid medium. Two electric eyes measure the speed of the drop and give scientists the SNF content reading.

The more solids-not-fat in a drop, the faster it passes through the medium.

For the test, scientists J. R. Brunner, G. Jacobs and D. M. Madden adapted equipment used by medical physiologists for determining the specific gravity of blood.

According to Dr. Brunner, readings obtained with the falling drop technique compare favorably with currently used lactometer methods. The advantage of the Michigan adaptation is that a much smaller amount of milk is needed for the test.

A capsule about the size of a lead pencil and 1½ inches long can hold more than enough milk needed for the falling drop test. This is many times less than the amount needed for taking a lactometer reading.

The Michigan State scientists feel that the new technique may open the way for eventual centralized testing of milk rather than the numerous scattered small testing laboratories in use today. The small sample of milk could be shipped easily at low cost.

Dr. Brunner indicates, however, that the technique may not be used generally until there is a move to buy milk on the solids-not-fat content rather than on the butterfat content basis.

—Michigan State University

Chimney Smoke

by Irene Rudie

Do not look for wrong and evil,
You will find them if you do;
As you measure to your neighbor,
He will measure back to you.
—Alice Cary

If the candidates for public office keep on nailing their pictures on our telephone pole we'll be able to harvest a half-pound or so of tacks when it is all over this fall.

★ ★ ★

Some of us still use wood to heat our home, or to warm up the kitchen on cool mornings. It is a joy to see a woodpile stacked in a farmyard in the old-fashioned way, in a symmetical cone, like a stack of grain.

★ ★ ★

The lean hog is the market ideal and if the trend towards low-calorie diets continues, the cow with the lowest test will be the most valuable cow in the herd.

★ ★ ★

Paper towels are an aid in the modern kitchen, but they can't do the work of those clean and expandable bits of cotton rag.

Houseplanners now r e c o m - mend that the laundry center be placed near the bathrooms and bedrooms rather than near the kitchen or in the basement.

★ ★ ★

An English teacher asked her high school students to write letters of condolence as a class exercise. After listening to her explanations of such a letter, a boy raised his hand to ask "Haven't you ever heard of sympathy cards?"

★ ★ ★

When the children were little I always had an eye to future make-overs when buying clothing; now I buy with an eye to color and fabric as possible material for a braided rug.

★ ★ ★

Jack rabbits and weasels that turn white in winter to blend into the white landscape must feel pretty frustrated in a snowless winter!

New Crop Varieties

These new varieties have resistance to insects and diseases built into them . . .

Condensed from Successful Farming

Scotty Woods

"BRED-IN protection" describes your new crop varieties.

They are developed to meet the disease and insect problems which cut yields and profits. Here are some of the outstanding releases for 1960:

Wheat

Monon wheat is a new soft red wheat developed at Purdue University. It is resistant to Hessian fly attack, and can be planted ahead of the fly-free date. Monon is about 2 or 3 inches shorter than Knox, and has greater straw strength. Yields compare favorably. It is very winter-hardy; and because it makes rapid growth in fall and early spring, it matures earlier than most wheat varieties now adapted to the Indiana wheat-growing region.

This Monon variety is resistant to leaf rust and soil-borne mosaic. It is susceptible to races of loose smut now common in Indiana. Although it is susceptible to stem rust, Monon is so early it escapes severe damage.

Avon is a second new winter wheat variety, developed in the East. It combines genetic resistance to loose smut, common bunt, and dwarf bunt. It is about 2 inches shorter than Genesee, and shows greater straw strength. This should prove to be an important feature, and Avon yields will go up on fertile soils where lodging is a problem. Milling standards and test weights of Avon are good. In time, look for Avon to replace Genesee as the favorite winter wheat variety in the Eastern areas.

Alfalfa

Cody, the spotted-aphid resistant variety of alfalfa, is being released jointly by Kansas and USDA. It is derived from plants selected from Buffalo alfalfa that showed resistance to aphid attack. During 3 years of greenhouse tests, survival of Cody seedlings

Reprinted by permission from Successful Farming, Des Moines 3, Iowa

averaged 72%, Lahontan 65%, and Buffalo only 6%! In a field attack, 97% of the Cody seedlings survived, 94% of the Lahontan, but just 34% of the Buffalo seedlings lived.

Though no seed will be available for spring planting in 1960, a substantial supply should be harvested in the fall, depending on weather conditions during the summer.

Cody yields as well as Buffalo in field tests where no aphids attack. It is resistant to bacterial wilt, but not to pea aphids. Will probably replace Buffalo.

Oats

New oat varieties are popping out all over, in the face of shrinking oat acreages. Here's a rundown on them:

Goodfield has been named for its performance on soils of high fertility. In many Wisconsin tests, where it was developed, Goodfield lodged as low as 3% where Minhafer showed 14%, and Burnett 21% lodging.

This variety is short, very stiff-strawed, midseason in maturity. Yields have not been spectacular, but maybe it will be worth sacrificing some yield to get the high test weight and the low lodging per cent of Goodfield. It is resistant to crown rust, and to races 6, 7, 7A, and 8 of stem rust. In addition, it resists the new race 290 complex. This group of crown rusts has invaded the North Central states, and could become a major problem.

Clintland 60 was developed in Indiana. Essentially it is Clintland with additional resistance to stem rust (which severely damaged Clintland in 1953-54). In addition to this added resistance to stem rust races 6, 7, and 8, Clintland 60 is resistant to all crown rust races except the 290 group, and to Septoria black stem. It is midseason in maturity; produces high yields and high test weights. The kernels are yellow, of medium size. Straw strength is good. This variety was increased in many states this year to supply seed for 1960 planting.

Worry is a thin stream of fear trickling through the mind. If encouraged, it cuts a channel into which all other thoughts are drained.

Minton oats has been developed and released by Minnesota. It contains resistance to all smuts, and all races of stem rust except 7A, and resistance to all crown rusts. Yields have been high, but test weight lower than other varieties. It is considered a late-maturing variety. Straw has medium height and strength.

Nehawka is a Nebraska release. It is shorter and earlier than

Cherokee or Bonham, has moderate straw strength. It has resistance to crown rust, is susceptible to race 8 of stem rust.

Macon is a Missouri variety similar to Missouri 0-205. It is early, high-yielding, with medium-height somewhat weak straw. Kernels are off-white to gray, and small.

Linear Programming New Technique For Farm Management, Says Experts

One of the newest farm management teams is linear programming and electronic computation. Together they are beginning to answer problems in farm planning and livestock feeding far too great for pencil and paper methods of calculation, report economists at Pennsylvania State University.

This new team has been put to work on problems of feed formulation, farm management, and planning farm operations to fit changing conditions.

The best dairy or poultry feed, researchers insist, is the one which supplies the necessary nutrients at least cost. With a myriad of ingredients to choose from and constantly changing prices, selection of the best feed formerly was impossible because of the enormous amount of ciphering that had to be done when costs or other conditions changed.

Electronic computers, such as Pennstac at Penn State, have made solution of problems of this kind possible, but only the largest millers have these machines. More recently, the scientists have worked out calculating devices and methods suited to usual office equipment. This will extend the usefulness of linear programming to small millers and farmers.

In feed formulations, entries in linear programming are ingredients, such as corn, oats or bran, and the requirements of the feed. In farm management plans, entries are the resources the farmer has to work with and alternative enterprises that use these resources.

By systematic selection, a combination of enterprises is selected for maximum net income from land, labor, machinery, buildings, and livestock. In this way, returns from expansion or contraction of the dairy enterprise may be compared with poultry, beef cattle, or sheep. —*Pennsylvania State University*

Antibiotics In Milk

Don't let your milk cause trouble for you and the dairy industry . . .

Condensed from University of Wisconsin Circular 575

THE problem of antibiotic adulterants in milk has come to a head, and may act to produce consumer sales resistance to milk and milk products. When found in milk, antibiotics and other drugs from mastitis remedies are, by Federal and State law, adulterants.

Penicillin is the most common antibiotic adulterant found in milk, but the more recent use of the tetracycline antibiotics, as "terramycin" and "aureomycin," may also be hazardous. In this category one may also include the cortisone compounds and various other drugs.

Control agencies have given the dairy industry a period of grace in which to "clean its own house," but have served notice that antibiotics and other drugs are not going to be tolerated in milk for market.

Adulterants Are Hazardous

The Food and Drug Administration, the medical profession, state control people and the cheese producers are all greatly concerned by this problem of milk adulteration. Surveys have revealed high percentages of milk on the market containing antibiotics.

Milk from treated mastitis quarters is responsible for much of this adulteration. A dairyman must follow strictly the rule of letting 72 hours (six milkings) go by before marketing milk from antibiotic-treated quarters. Any introduction of antibiotics into the milk supply must be prevented.

Court Action

Checking is now being done. Several dairymen have recently been fined for adulteration of milk with antibiotics. This checking will continue, with resultant court actions where the dairyman is found to be marketing milk containing antibiotics. Several tests for the detection of antibiotics and other inhibitory substances are now available.

Cow Health Problem

Serious cattle health problems have been created by the indis-

Reprinted from University of Wisconsin Extension Circular 575, College of Agriculture, Madison 6, Wisconsin

criminate use of mastitis treatments. For example, by using antibiotics too frequently and too freely, many dairymen have changed the mastitis in their herds from the streptococcus to the much worse staphylococcus form. In many herds even mold infections have evolved, for which there is no specific treatment.

Prevention Is Best

Treatment of mastitis certainly has its place, but it should be used only in conjunction with a sound, preventive program which can be established with the aid of the local veterinarian. Prevention of mastitis is less costly, is a more positive approach, and adds to the economic efficiency of the herd.

Systematic Treatment

Whenever large doses of antibiotics are used in an effort to control mastitis or any other disease (foot rot, pneumonia, etc.), the milk from all four quarters of the treated cow should be discarded.

The Problem Is Important

This problem is important from the standpoint of the market, the cheese factory, human health and the cow. The guilty producer must "clean his house" so that the consumer's question can be answered with pride — that the dairy industry is producing milk that meets every standard of wholesomeness. This period of grace given by control agencies seems certain to be followed by stringent enforcement and heavy fines wherever antibiotics appear in milk.

What The Dairyman Can Do

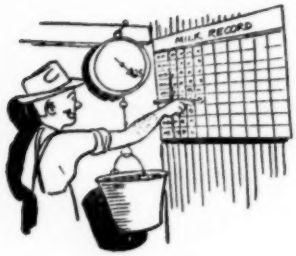
- Put the stress on prevention and not treatment of mastitis.
- Always allow 72 hours (six milkings) to pass between the last time a cow is treated with antibiotics and the time milk from a treated quarter is marketed.

Lowly Corncob Finds A Place

The common corncob is coming into its own. An estimated two million tons of corncobs are used each year by agriculture and industry. Most of them are ground and used in livestock feeds. About a half-million tons are used in preparation of a chemical important in the nylon industry and in refining oil. The remainder are used as mulches for shrubs, cleaners and polishers for metal stampings, and for dryers in electroplating operations. They are also used to make soft abrasives for air cleaning engine parts and electrical equipment, and as a polish for handsaws and braces.

—Louisiana State University

The Rumen Revolution



Better feeding as well as better breeding has boosted milk production per cow . . .

Condensed from Feedstuffs

THE rate of milk production per cow has increased more than 150% during the past 50 years. The number of milk cows on farms in the U.S. has been dropping off in recent years, but total milk output has held up or increased because of the bigger production per cow.

Better feeding as well as breeding has had much to do with this remarkable record.

The average milk production per cow per year is now about 6,300 lb. And many cows do far better than this. In fact, there is no reason why we should not aim for an average annual production of at least 10,000 to 12,000 lb. of milk per cow, or about double the present average.

Part of the improvement in feeding results can be attributed to greater knowledge of what goes on inside the cow's rumen or paunch. However, there is room for a lot more progress, and that progress is sure to come. One big reason is that we are in the midst of a "rumen revolution." Scientists are now able to cast more light into the rumen, which is no longer such a dark, mysterious part of the cow's anatomy.

Just How Are We Doing today?

One industry scientist cited the following as typical good results:

A milk production test, using Holsteins on a 10-month lactation—

- 45.8 lb. average daily milk production per cow.
- 0.97 lb. feed efficiency (dry feed basis per pound of milk), with 0.32 lb. from formula feed and 0.65 lb. from hay and silage.
- 1.47c feed cost per pound of milk.
- $2.53 income over feed cost per cwt. of milk at 4c per pound.

Before the cow reaches the point where it is producing milk, there is the period of growth and

Reprinted by permission from Feedstuffs, American Feed Manufacturers Association, 53 W. Jackson Boulevard, Chicago 4, Illinois

development. It is in the feeding of the young dairy calf that the formula feed industry has played a particularly important role.

Fifty years ago, calves (which come into the world as non-ruminants) were usually fed whole milk for about two months and skim milk to about six months of age. Either coarsely ground or whole cereal grains were also fed along with hay. This system of raising calves was adapted to farmers where cream was sold. Then the expanded whole milk market, brought about by a greater appreciation of milk as a food, increased the need for good milk replacers.

The Feed Industry has provided these milk replacers, making it possible for the dairy farmer to feed his young calves economically and well while still selling his whole milk.

Milk replacers have four chief advantages: (1) Economy, (2) nutrition, (3) health and (4) rumen development.

The economy is in the saving in whole milk. For example, a test with identical twin calves showed that at the end of their eighth week, one fed on 54 lb. of milk replacer and only 20 lb. of whole milk along wih starter pellets, grain and hay weighed just about the same as the sister fed with 441 lb. of whole milk and no replacer along with starter pellets, grain and hay. Feed costs per pound of gain were 21.5c for the calf fed milk replacer and 34.7c for the sister. The dairy farmer can save about $8 per calf, and millions of pounds of milk are saved for human use.

As for nutrition, the improvement with replacers is very clear in tests showing that replacer-fed calves grow 30 to 40% faster than those on whole milk. Health is mighty important, too. With the nutrients, antibiotics and other additives in replacers, calves have less digestive disturbances and are healthier and sturdier. Early development of the rumen in the calf also is important, and calves fed milk replacer will show rumen activity as much as two weeks earlier.

Our greatest asset is the land. Poor land makes poor people. Productive land makes prosperous people.

Going beyond just the milk replacer aspect of calf feeding, one comparison has shown that the cost of feeding a dairy calf to eight months is about 40% less on a modern program than it would be if calves were still fed as they were on a typical program of 30 years ago.

However, feeding the dairy calf is only the start in produc-

tion of milk. The cow, with her ability to convert roughage as well as concentrates into a valuable food, is an important food factory. That is why so much attention has been given to what goes on inside the cow's rumen or "fermentation vat."

As A Result Of The "Rumen Revolution," we now know that rations should be geared to the rumen. The "bugs" in the rumen can turn hay into milk through their ability to digest sugars, starches, cellulose and related compounds. The bugs also convert proteins and other nitrogen compounds such as urea into ammonia. Fatty acids in the rumen synthesize the ammonia, and

Ten million Americans, who live in a scientific age, waste 500 million dollars a year on quack diets and fake pills and the junk of non-scientific medicine men.

the rumen bugs then synthesize or build this ammonia into protein that can be used by the cow in her body.

Actually, dairy cattle feeding had a good start even 50 years ago, thanks to the advances in the art of feeding and to some extent to the science of nutrition. This early progress was primarily due to the fact that cows are geared to transform large amounts of roughage into milk. Forage supplied dietary factors needed to supplement grains. Also, the food constituents made by the microbes in the cow's fermentation vat made better feeding possible long before vitamins were discovered or, in fact, before we knew about bugs in the rumen.

However, there were not many scientific studies of the fermentation vat until fairly recently. During the 1930's it was shown that rumen microbes digest fibrous feeds by producing enzymes that do the job. This was a big step since the ruminant itself does not produce such enzymes. Another major advancement came with the finding that rumen microbes can make high quality protein from simple nitrogen compounds such as urea.

The forward progress continued in the 1940's. Scientists showed that rumen microorganisms convert carbohydrates (starch, sugar celluloses, hemicelluloses) to certain fatty acids in a certain ratio. They also proved that these fatty acids were absorbed through the rumen wall. A good share of the energy that cows get from their feed comes from these acids.

Although Many Factors have contributed to the big increase in rate of milk production per cow, most authorities agree that better feeding has made the greatest

contribution. Marked improvement in the nutritive value of pasture, hay and silage crops has done a great deal. Also important is the increased amount of grain and other concentrates fed to milk cows. The estimated amount in 1942 was 1,200 lb., compared with more than a ton per cow yearly today. Modern formula feeds have had an important place here. In the early 1930's, about 15% of the concentrate rations fed to milk cows were manufactured feeds. Today, formula feeds account for close to 30% of all grain and concentrates fed to milk cows.

Calf Milk Replacers Need Added Fat

Milk replacer for calves should contain some added fat, a University of Minnesota dairy cattle researcher said recently.

W. A. Olson reported studies in which 30 per cent lard added to milk replacers doubled growth of calves for the first 28 days.

Speaking at the annual meeting of the American Dairy Science Association, Olso explained why the early growth is so important. Calves which grow more rapidly in the first 4 weeks, he said, are usually healthier and better able to fight off ailments like scours or pneumonia.

Faster growth is also important, of course, if the calf is being raised for veal.

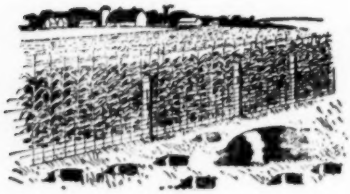
Olson compared 5, 10, 20 and 30 percent stabilized lard in milk replacer diets for dairy calves. At the end of 28 days, calves on the different replacers had averaged .39, .52, .49 and .65 pounds daily gain, respectively. Those getting no fat averaged .32 pounds per day — or roughly half of those on the highest fat level.

As calves became older, however, the extra fat became less important. At weaning time, when the calves were 42 days old, average daily gain was .76 for those getting no fat and .93 for those on the 30 percent level. Calves on other fat levels were in between these two extremes.

Calves getting no fat had more trouble with scours, Olson said.

In addition to the lard, milk replacer used in this study was made from fortified, low heat, dry skimmilk solids. A total of 33 calves were used in the study. *—University of Minnesota*

Artificial Insemination In Swine



This new field has great problems and great promises . . .

Condensed from The A. I. Digest

H. L. Self, Iowa State University

THE technique of artificially inseminating semen into the reproductive tract of the female is not new. Recorded history indicates than an Arabian Chieftain artificially bred a prize mare in 1322 A.D. It was also used at an early date in dogs.

More recently it has been used in practically all farm animals, but much more widely in some species than in others. There are millions of dairy cows and many chickens and turkeys artificially inseminated each year, but except for research and experimental work, relatively few swine have been inseminated artificially, although the technique is not new in the species.

The Russians reported fairly large numbers of swine were being artificially inseminated in the early 1930's. The Missouri Experiment Station worked on this problem about the same time. Other experiment stations have also worked on the problem occasionally, but only within recent years has the shift to the Meat Type Hog, multiple farrowing, confinement rearing and more intensive production systems created a need great enough to encourage the research necessary to overcome the technical problems involved.

Boar Semen Is Different!

Boar semen differs from bull semen in a number of important respects. Among these differences are much greater volume, lower sperm concentration, a higher pH (less acidity), and the presence in abundant amounts of certain chemical constituents such as ergothioneine and inositol, which are virtually absent from bull semen. Storage in the various diluters is much less effective for boar semen, and attempts to freeze boar semen have resulted in very few motile sperm upon thawing with almost complete lack of fertilizing capacity. The reasons for these marked differences are not known, and alternative methods have not yet been

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developed for preserving boar semen. Such methods would be highly advantageous for the widespread use of artificial insemination of swine.

Research on swine artificial insemination was renewed at the Wisconsin Station early in 1956. At that time it seemed necessary to evaluate the extent of our knowledge and to determine how much of what had been learned about bull semen could be applied to the semen of boars. Unfortunately, there is little similarity in the way the semen from the two species react to handling and storage.

Cows And Sows Differ

Most people are somewhat familiar with the technique of artificial insemination in cattle. The cow has a shorter, thicker walled uterus than the sow. The uterus in the sow has a short body with two long uterine horns, one curving to the right and one to the left. Each of these uterine horns may be four feet or more in length in older sows. Sperm must traverse the entire length of each horn in order to get to the site of fertilization near the ovary. In swine there are many eggs to fertilize instead of only one as in cattle. If a large percentage of the eggs fail to become fertile the litter size will be small and this cannot be detected until the litter is farrowed. If the single egg in a cow is not fertilized, she will return to heat and can be rebred. In other words, litter size is an additional problem in swine that cattle breeders do not have to contend with. Only one cc. of diluted semen is required in the cow, but supposedly due to the difference in the anatomy of the reproductive tract in the two species, much larger volumes are needed in the sow. It is not difficult to visualize that 1 cc. or even 5 cc. of semen could become "lost" in the long uterine horns of the sow. Therefore the greater volumes are necessary in the sow or gilt at the present time. Research is underway to try to reduce the volume and sperm number requirements, but there is much work to be done on it yet. For example, the exact role of the large volume has not been determined but the most logical explanation at present is that the large volume of fluids act simply as a carrier of the sperm and tend to "wash" or flood the sperm toward the ovarian end of the long uterine horn.

The man who does not read good books has no advantage over the man who can't read them.

In 1956, fairly large volumes

of fresh semen were thought to be required to produce uniformly satisfactory results. We now know that on an average 20 cc. of fresh semen diluted to at least 50 cc. will give good results in gilts. (For comparison purposes, a pint is equal to about 500 cc.) Research now in progress indicates that this level may soon be lowered thus increasing the number of females than can be inseminated per collection.

Boars Differ—Just As Bulls Do!

Some boars will produce only 100 to 150 cc. of semen at one collection while a few boars produce as much as 500 cc. at a single collection. In general, however, the average collection from a boar measures about 250 cc. About one-fifth of this (50cc.) is a sticky gelatinous material which must be removed by straining before use. This leaves about 200 cc. of useable semen or roughly enough to breed 10 sows per collection — provided 10 sows are available for breeding soon after the collection is made. If a boar is to be on a continuous collection schedule, he should not be collected more frequently than twice weekly. Under ideal conditions, this would permit a total of 20 sows per week or a maximum of about 1,000 sows per year per boar.

● **Between 1940 and 1954, average acreage of farms used for harvested crops rose 44 percent.**

Present knowledge makes it possible to obtain satisfactory conception rates with semen stored for as long as one day, but as the length of storage increases beyond one or two hours the amount of semen required per sow increases. Storage for one day is more than twice the storage time being used three years ago. More progress is being made in this area every day. For example, under experimental conditions in the laboratory, it has been possible to occasionally obtain fertilization of the eggs of the female with boar semen stored for as long as five days. However, there is much yet to be done to make this a common occurence in the laboratory and the use of storage periods of this duration under field conditions will have to await further developments.

Why A.I. in Swine Is Worthwhile

Many of the advantages of using artificial insemination in swine are quite obvious, but enumerating a few of the major ones may be worthwhile.

1. It will decrease the spread of disease at breeding time.

2. It provides semen from production tested boars to small

commercial sow herds at a reasonable cost.

3. It provides a means of breeding outstanding sires to a greater number of purebred females.

4. It will speed up the shift to the Meat Type Hog.

5. The investment in boars and boar handling facilities on the producer's farm would be reduced.

6. The problem of differences in age and size of the boar and the female would be overcome. This would increase the length of time that an outstanding boar could be used. The rapid rate at which swine grow has resulted in the loss of the services of truly outstanding sires after only one or two seasons of service.

7. The use of sterile or low fertility boars would be reduced because it would be possible to examine the semen before the female is bred.

8. Artificial insemination in swine will complement multiple farrowing (farrowing several groups of sows per year) because it allows a large number of sows to be bred in a short period of time. (For example, sows returning to heat after weaning litters could all be bred to the same boar.)

9. The supply of market hogs would be more uniform in type. (Gilts saved for the herd would be similar in breeding.)

These are only a few of the advantages of artificial insemination in swine, logically, the question of disadvantages must be dealt with. The major ones are outlined here:

1. At the present time too few sows can be bred per boar in any one breeding period or season. (For example, it is possible to breed as many as 500 cows from one collection of a bull, compared to 10 or 12 for the boar.)

2. At present the semen cannot be stored sufficiently long to allow semen from a certain boar to be available from one collection to the next.

If all the cars in the United States were lined bumper to bumper on a long hill, some fool would try to pass them.

3. It is sometimes difficult to determine exactly when a sow or gilt is in heat if there is no boar on the farm. (If a sow is not bred at the proper time of heat, litter size may be reduced.)

4. Each sow has to be handled individually which eliminates the pasture breeding method used by many swine producers. Although actually conserving "boar power", it requires some extra labor.

There are very few sources of

boar semen at the present time. Up to now there has not been a promise of enough returns from breeding fees to make it profitable.

In summary it can be said that artificial insemination will be available to some swine producers on a limited scale in the fairly near future, and to a greater extent as soon as some of the technical problems are worked out. These are difficult problems and probably will be solved on a continuing basis rather than all at once. It will take time, just as it has in the case of dairy cattle, but when it does come it will be one of the strongest tools available to the swine industry in producing a uniformly high quality pork product capable of regaining some of the pork market which has been lost to other kinds of meat in recent years. A great deal of effort and money have gone into swine testing stations during recent years in an attempt to locate superior breeding stock. However, locating really outstanding sires by production testing is only a part of the job. These sires must be used to the fullest extent if the swine industry is to continue to meet competition from other species in the area of growth rate, feed efficiency and carcass quality.

Culling Guide

Check this dairy cow culling guide. If you answer "yes" to most of the questions, culling is indicated.

- If she is a first calf heifer, has she produced 30 percent below your herd average?
- Is her 305-day mature equivalent lactation record below the average herd mates freshening during the same year and season?
- Will she be dry 6 months or more?
- Does she have a record of mastitis?
- Is she positive to Bang's disease test?
- Does she have a record of breeding troubles?
- Did she have complications after her last calving?
- Does she have a record of milk fever or ketosis?
- Is the price of beef average to good?
- Is she below the average type of your herd?
- Is she a slow milker?
- Will it pay you to replace this cow with a higher producer?
- Will it pay you to remove this cow without replacing her?

—California Dairyman

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

A tax expert helped a farmer prepare his income tax return. Most of the items were easy to interpret, but one read "Horse, $10." "Did you buy the horse for $10 or sell him?" asked the expert.

"Well," said the farmer, "it's like this: I bought that ornery animal for $10. He right away kicked down two stalls, and that cost me $10. Then I used him to pull a car out of a mud rut and got paid $10. Once I sold him for $10, but he caused so much trouble I bought him back for $10. I used him to take some kids for a ride and they gave me $10. Finally that fool horse wandered onto the highway, and a guy hit him and killed him. He paid me $10, but then I had to turn around and pay $10 to have the carcass hauled away.

"Finally," said the farmer, "I must have lost track somewhere, because I can't figure whether that durn horse ended up owing me or me owing him!"

David and Elaine Heinrich,
The Progressive Farmer

Life without humor is like an automobile without springs.

★ ★ ★

A romantic bachelor, breakfasting in a restaurant which boasted that its eggs were the freshest in town, noticed that one of his four-minute eggs bore the inscription: "Should some young man see this who wishes to marry a farmer's pretty daughter of 17, write . . . "

He wrote promptly, and a few days later received this note: "Sorry, your offer came much too late. I've been married twice, widowed once and have three children." —*Iowa Farm Bureau Spokesman*

★ ★ ★

Any man who thinks he is more intelligent than his wife is married to a smart woman.

★ ★ ★

The bull had caught the hired man halfway across the pasture and chased him into a tree. After being rescued, the hired man was saying: "Just as I felt his horns on the seat of my pants, I leaped for a low-hanging branch — about 20 feet off the ground . . ."

"Did you make it?" someone asked.

"Not on the way up," the hired man replied, "but, fortunately, I grabbed it coming down."

★ ★ ★

Fellows who drive with one hand are usually headed for the aisle of a church. Some will walk down it — others will be carried.

★ ★ ★

A sign on a rubbish collector's truck in Grand Rapids, Michigan, reads: "Satisfaction guaranteed, or double your rubbish back."

★ ★ ★

Many girls
Of single lot
Who live alone
Would rather knot.

★ ★ ★

Two little girls came home carrying a box of dirt. Their mother saw that they handled the box as though it contained some treasure. "What's so special about the stuff you've go in that box?" she asked.

"Why, it's our new invention, Mother," one replied. "It's instant mud-pie mix!"

—*Catholic Digest*

★ ★ ★

The teacher had occasion to reprove a small boy for swearing.

"If you feel you must say something, just say 'bother,' she said. "Your father doesn't swear, does he?"

"Oh, no!"

"Well, then, if he were working in the garden, and suddenly stepped on a rake which flew up and hit him from behind, what would he say?"

"He'd say: 'You're back early, dear!' "

★ ★ ★

Ad in old rural newspaper: "Owner of tractor wishes to correspond with widow who owns modern thresher; object matrimony. Send photo of machine."

★ ★ ★

The human brain is like a freight car — guaranteed to have a certain capacity, but often running empty.

★ ★ ★

The boy was practicing his violin lesson in the house, while out on the porch, his younger sister was playing with the dog. As the boy scraped away on his fiddle, the hound howled dismally. The sister stood it as long as she could, then she poked her head in the open window and said:

"For goodness sake, Jimmy, can't you play something the dog doesn't know?"

★ ★ ★

The amount of sleep required by the average person is about five minutes more.

★ ★ ★

An old hillbilly and his wife went to the city on business. Since they had never stayed over-

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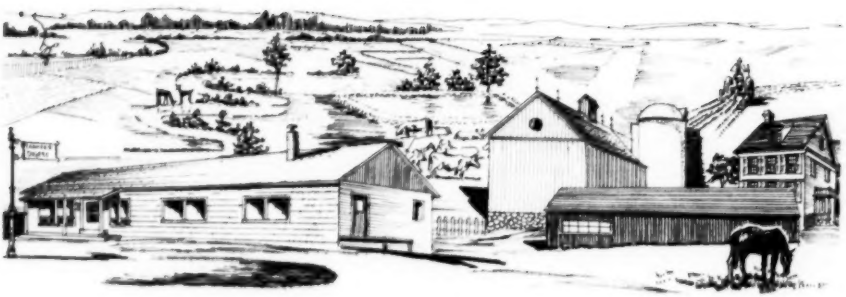

Here's a sketch of our farm where we publish Farmer's Digest. Our 200-acres are planted to corn, alfalfa, grass and trees. We farm — and we publish our magazine on a farm — because we believe that's the only way we can know what other farmers want to read. Farmer's Digest is probably the only farm magazine in the world published on the farm by farmers.

night in a hotel, they decided on the most expensive in the city. They were shown to their room.

A television set was turned on when they entered, so they sat down and enjoyed the show for a while.

Then the old man became angry and shouted to his wife, "Maw, tell those show people to get away from our window so I can undress and go to bed."

★ ★ ★

Sign in Factory: "Look alive — you can be replaced by a button."

★ ★ ★

There was a broken fence between heaven and hell. The devil sent a note to the angels saying: "On advice of legal counsel am pleased to inform you that the repairs are entirely your responsibility."

The heaven administrator replied.

"Having no legal counsel to advise us, we have decided to repair the fence."

—*Santa Fe Magazine*

★ ★ ★

A psychiatrist is a man who doesn't have to worry, so long as others do.

★ ★ ★

A tourist stopped where a farmer was erecting a building. "What are you building?" he asked.

"Wal," answered the farmer, "If I can rent it, it's a rustic cottage. If I can't it's a cowshed." —*Implement & Tractor*

★ ★ ★

And so they got married . . . and lived happily even afterwards.

★ ★ ★

Little Bobby, scolded for being naughty, was asked by his mother, "How do you expect to get into Heaven?"

He thought for a moment, then replied:

"I'll just run in and out and keep slamming the door until they say, 'For goodness sake, come in or stay out. Then I'll go in."

★ ★ ★

A great many Americans trust in God. You can tell by the way they drive.

★ ★ ★

It's easy to criticize—
Gripe, moan, and stew.
S'ppose that's the reason
That most of us do.

★ ★ ★

The little boy wanted $100 so badly he decided to pray for it. He prayed for several weeks with no results. So he wrote to God.

The Post Office finally forwarded the letter to the White House. The President chuckled and ordered $5 sent to the boy. The boy, delighted that his prayers had been answered in part at least, wrote a thank-you note to

God but added a P.S. Quote: "I noticed you routed my letter through Washington and, as usual, the bureaucrats deducted 95%."

—Western Crops and Farm Management

★ ★ ★

The gum chewing girl
And the cud chewing cow
Are somewhat alike,
But different somehow.
The difference . . . Oh yes,
I can see it now!
It's the thoughtful look
On the face of the cow!

—By a Kentucky Dairy Farmer

★ ★ ★

In a northern Michigan courthouse, a sign on the closed door of the marriage bureau reads: . . "Out to lunch. Think it over."

—Michigan Farmer

Stilbestrol Most Reliable Feed Additive

Stilbestrol one of several feed additives on the market today for fattening cattle, has given the most consistent benefit of all feed additives tested in recent years.

T. R. Greathouse, University of Illinois extension livestock specialist, reports that stilbestrol has produced an average response of 18 percent in weight gain. This result compares with 4 percent for antibiotics, 11 percent for tapazole and 12 percent for enzymes.

On the average, stilbestrol-fed cattle require 12 percent less feed. Tapazole saves only 6 percent of the feed; and antibiotics, 3 percent.

Here's a brief summary of other feed additives that have been under test:

Antibiotics: The biggest problem of antibiotics is their lack of consistent benefit in various feeding trials.

Tapazole: Tapazole's advantage is greatest if fed only during the last 30 to 60 days of the fattening period. It is not available on the market though.

Enzymes: These additives are new and they produce no response in cattle on high-moisture grain-type rations. More work is needed to justify use of this additive.

Live rumen culture: In general, use of this additive has failed to demonstrate any advantage in average dairy gain and feed efficiency.

Chemobiotics: Results of this additive have varied. On the average, it has proved less efficient than antibiotics.

Tranquilizers: The average experimental results with this additive have not shown an improvement in average daily gain or feed efficiency in the fattening ration. *—University of Illinois*

The Ewe's First Milk

Colostrum is nature's bank account for the newborn lamb . . .

Condensed from The Shepherd

THERE is no more precarious entry into life among farm animals than that of a lamb in February or early March:

Rich in protein, vitamins, and antibodies. the colostrum is nature's way of protecting the lamb and strengthening it quickly for its adventure in life.

The colostrum or first milk that the ewe produces for her newborn lamb is richly fortified by nature with strengthening substances that help to get it off to a good start. For the first day or two after the lamb is born, this milk is especially rich in antibodies which help protect the lamb against disease in its early life — these fighting elements in the bloodstream of the young lamb combat disease germs and thus provide the lamb with a degree of immunity against early infections.

Every newborn animal is dependent for the first few weeks or months of its post-natal life on antibodies obtained from its mother. In species such as man, most of the antibodies the newborn receive are transferred from the mother's blood across the placenta just a few weeks or days before birth. In species such as horses, cattle, sheep and swine, the antibodies are obtained almost entirely from the colostrum, or first milk.

Time is very important in this because the antibodies in colostrum will not pass through the lining of the gut and into the bloodstream of the new-born after they are more than about 48 hours old.

Loaded Milk

The first milk the lamb receives from its mother (colostrum) is "loaded". It is loaded with more than the growth vitamin A and protective antibodies from the bloodstream of the mother . . . A Rumanian scientist found 7.47 to 23.18% of protein in the colostrum on the first day after lambing. During the next ten days the protein content fell to 4.73-6.18%. By the eighth day the milk had almost completely lost the characteristics of colostrum and become plain ewe milk.

Reprinted by permission from The Shepherd, Sheffield, Massachusetts

In the natural course of events, the newborn lamb gets its first drink of warm rich colostrum within the first hour of its life, and all is well. However, there are times when for one reason or another the lamb may not connect promptly with the colostrum, and that is when the shepherd needs to become nature's ally. The new mother ewe may have too much colostrum for her lamb, or too little. Sometimes the nipples are so large, inflamed and distended with milk that even the most persistent little lamb cannot hope to get its mouth around one. Here the shepherd can help by milking out the enlarged udders until the nipples reach a more normal size, at the same time preserving the colostrum for some less fortunate lamb; if there is no needy lamb at the time, the milk can be frozen for a future emergency. When there is insufficient colostrum for twin or triplet lambs, frequently some can be borrowed from a heavy-milking ewe who has more than enough for the needs of her single lamb.

The borrowed colostrum can be fed with a bottle, but it should be luke-warm as cold milk may give the young lamb a stomach ache or colic. But don't over-heat a bottle containing colostrum, since this new milk coagulates in the bottle under excessive heat. Bottle-feeding should not be attempted unless the newborn lamb is strong enough to suck. If the lamb will suck on your little finger, it is ready to suckle. Care must always be taken with a very young lamb to make sure the hole in the nipple is the right size — large enough to permit an easy flow of milk so that the lamb won't get discouraged and stop sucking, yet not so large as to choke the lamb with too rapid a flow. The place for milk is in the stomach, not in the lungs where it induces pneumonia and cannot be removed.

In its first week of life, the lamb needs frequent small feedings — 2 or 3 ounces of milk at a time, spaced about 2 or 3 hours apart, about 8 feedings a day.

Save more pigs with a pig brooder.

If a ewe does not come into milk as soon as the lamb is born, she should be given all the luke-warm water she will drink; sometimes she can be coaxed to drink more, by sprinkling a little bran or fine grain on top of the water.

The colostrum might be called nature's bank account for the newborn lamb, and the good shepherd sees to it that each new lamb gets its full share of the life-giving factors in that first rich milk.

Let's Have 14 Hours A Day For Laying

This British article tells how to maintain maximum egg production with lighting control . . .

Condensed from Farmer and Stock Breeder

EXTENDING the period of natural daylight by artificial means should be seriously considered by all commercial egg producers.

Beginning in September and continuing until the end of April, the number of hours of daylight is less than the minimum required to maintain maximum production, and there is no doubt that by artificially controlling the hours of light and darkness egg production can be maintained and the associated problem of moult controlled.

As the hours of natural daylight decrease after midsummer, egg production falls, and birds that have been in lay since winter or early spring tend to go into a moult. This may extend right through until the end of the year, the time when the length of daylight begins to increase.

The explanation of the stimulation of production by light has received the attention of scientists engaged in studies of avian physiology. The most obvious explanations investigated were: does the light *per se* acting through the eye produce stimulation of the glands controlling the activity of the bird's ovary; or does the light merely act by keeping the birds awake and thereby increasing the time available for feeding, resulting in more food being consumed and more eggs laid during the same number of days?

Vital Hormones

The sum of published evidence seems to point to the fact that light produces, through the eye, a direct stimulating effect on the anterior pituitary gland, and this *secretes hormones which are responsible for regulating the activity of the ovary.*

Laying Hens: The stimulation of production in commercial laying flocks by artificially illuminating poultry houses at night during the autumn, winter and

Reprinted by permission from Farmer and Stock Breeder, Dorset House, Stamford Street, London, S. E. 1

early spring months is widely practised.

Electric light bulbs or fluorescent tubes are equally effective. Time switches, which turn the light on, or off, at preset times, are usually incorporated in the lighting circuit so that no extra labor is involved and no one is inconvenienced at all.

Lights of various colors when used at the same intensity have been found to be nearly equally effective. Birds illuminated respond as well to white red or white plus ultra-violet lights.

The source of light should be hung about 6 ft. from the floor, and (if 40-watt bulbs are used) not more than 10 ft. apart. They should illuminate the perches and drinking vessels as well as feed troughs, but not shine directly into the nest boxes. Food and water should be available during the period of lighting.

Never warm up your tractor indoors unless doors and windows are open for maximum ventilation. Carbon monoxide cannot be detected by odor, so avoid the danger completely.

Systems of Lighting: The following are the most popular systems in commercial use: (1) evening lighting, (2) morning lighting, (3) continuous night lighting, and (4) a period of night lighting.

The evening and morning lighting programmes should be calculated and regulated to give 14 hours of light in each 24 hours. This means that the time switching on and off must be related to the times of sunrise and sunset.

A system of morning lighting in which the lights go on and off at a fixed time each day cannot be wholly justified, as although this produces a sudden jump in the level of production, the day-to-day period of light falls from the day on which the lights are switched on until the shortest day of the year (thus acting like an extended autumn) and then extends as the days lengthen.

Poorer Response

Experiments at the National Institute of Poultry Husbandry showed that all-night lighting produced a poorer response than the morning and evening systems. A short period (1-2 hours) of light in the night time, and flash-lighting with high-intensity bulbs have been tried and found to be effective.

Whatever system is used it is important that the lighting is regular and is continued throughout the winter months. If lighting is irregular, or temporarily discontinued, the best results will not be obtained.

Can Population Catch Up With Our Food Supply?

Population is exploding. Unless farmers continue to produce more and more, the big problem in 1975 may be scarcity instead of surplus . . .

Condensed from Massey-Ferguson Farm Profit
Ray Reiman

FOR each three mouths to feed in the U. S. today, there'll be nearly four by 1975. And the average person will likely be spending more money for food — especially more meat, milk, fruits and vegetables.

That's the big job facing America's farmers . . . to increase food production about 33% during the next 15 years. U. S. population has already topped 177 million — following a 27% jump since the end of World War II. And about 8,000 new customers cry out to greet us every morning. Population experts say we'll have about 30% more Americans to feed by 1975.

That's a whopping 230 million people as a "middle road" among projections that range as high as 244 million! And you can count on millions of additional friends to feed in rapidly expanding foreign countries.

Meat, milk, egg and other food consumption has jumped since 1935. Demand for these "choice products" is expected to increase rapidly during the next 15 years as income continues to rise and tastes work upward.

"To satisfy the consumer demands expected by 1975, we'll have to produce about 58% more beef and veal, 41% more pork, 40% more milk, 35% more eggs and 18% more poultry than the estimated production in 1959," predicts Carroll Downey, USDA economist. Can we continue to boost food production enough to keep up with this booming demand? Or will we soon eat our way out of surpluses?

We took these questions to the nation's leading experts on agricultural requirements and output. They're in general agreement that, even with population soaring and demand continually

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tices, 1975 yields would be boosted 20% to 25%.

Greater feed efficiency. By 1975, a pound of feed should produce about 10% more meat, milk and eggs.

Higher output per animal. Besides better feeding methods, the greater feeding efficiency above takes into account about 7% more beef produced per cow, 14% more pork per litter, 27% more milk per cow and 12% more eggs per layer.

More and better forages. They will especially be required to meet the 58% boost in demand for beef. This can be achieved partly through expanding total acreage and through shifting land out of surplus crops; but much must come through improving pastureland.

It's the little things that annoy us — we can sit on a mountain but not on a tack.

More specialization. Specializing in more suitable crops both on individual farms and in various parts of the country would increase total output.

Greater output per man. Output per man-hour of farm labor will more than double between now and 1975 if the trend of the last 10 years continues. Time-saving practices and new machin-strengthening, it will be a long time before population catches up with our vast potential production.

Predicts Dr. Glen Barton, prominent USDA production economist: "By just making greater use of the farming technology known today, I'm confident we can go a long way toward meeting 1975 requirements. This does not include use of new techniques which will certainly be added to farming methods during the next 15 years.

"To achieve this goal, however, will require a number of adjustments. For example, we'll need to shift some crop-land production from wheat and some other crops to livestock-producing grassland and other forages."

Extensive USDA studies suggest various ways by which greatly expanding production demands can be met *without* adding new technology:

New cropland. This resource is limited. Even so, about 30 million acres (about 5% of current cropland) may be added if public programs and related farm improvements continue to progress.

Higher yields. This will be our chief means of meeting 1975 farm output needs. Based mainly on the technology now known and on the speed at which farmers adopt new improved prac-

ery may make it possible to do the mammoth production job with a third fewer man-hours than used today.

Will these giant production possibilities be matched by the rise ahead in food needs? Not for some time.

"Barring an unforeseen spurt in demand because of war or other emergency, a big increase in foreign demand, or some means of reducing production of certain crops, we're not likely to eat our way out of surpluses for 10 to 20 years," says H. L. Stewart of the Agricultural Research Service.

"We're now producing about 5% to 8% more farm products than we need each year, with current output already about enough to meet estimated needs four to five years from now. Without severe drouths, an excess rate will likely continue for some time."

Harvard's John Black predicts: "Our excess capacity to produce will continue to outrun our foreseeable consumption about 5% per year throughout the 1960's."

All this does not mean there's no future for the alert farmer or rancher. But for many it means adjusting to efficient production of the high-quality products that consumers will want more of in future years.

Keep in mind the big meat, milk, fruit and vegetable demand that lies 10 to 20 years ahead . . . and gear your operations accordingly, realizing there may be many rough spots in between. With a greater share of the country's wage-earners moving into the higher income brackets and buying more of these "Choice foods," the man who produces them will reap the lion's share of farm profits.

Drainage Aids Timber Growth

Better drainage may hold the key to greater profits for timber owners.

Drainage in woodlands gives faster, more noticeable results than any other thing that can be done to help produce more wood on wet areas. Large companies are doing extensive ditching to improve timber growing on their lands.

With timber prices likely to remain at or above present prices, foresters believe that even small timber owners should consider increasing their timber production through drainage.

—North Carolina State College

How To Reduce Herd Turnover

So much depends on you. In fact, the first requisite of a profitable dairy business is a good dairyman . . .

Condensed from Guernsey Breeders' Journal

Prof. Ralph Bonewitz, Kansas State Univ.

REPLACEMENT costs are terrific for the average dairy farmer.

Many studies show that 20 to 25 per cent of the dairy cows on an average farm must be replaced each year. This means that the average life of a cow is about five years, and she milks for only two or three lactations. Certainly we could improve the efficiency of milk production by doubling the life of the cows in our herds.

Table I.

21-year summary of Kansas DHIA records, 1937-1958*

	Number	Per Cent
Low Production	14,459	32.29
Dairy Purposes	12,072	26.96
Udder Trouble	5,780	12.91
Dead or other reason	5,599	12.50
Sterility	3,055	6.82
Old Age	1,826	4.08
Accidental Injury	284	.63
Bang's	1,537	3.43
Tuberculosis	69	.16
Bloat	100	.22
Total	44,781	100

The table above from Kansas records provides a graphic picture of why cows leave the herd.

Approximately 32 per cent of the dairy cows in Kansas left home because of low production. This is probably no different from other sections of the country. It would seem that this phase of the dairy project should be given a lot of thought by every dairyman.

We now have a very sound tool for improvement of dairy cattle, which is the bull with the artificial proof, or the average production of the artificial daughters.

Table II.*

Fraction of superiority of first AB proof repeated in production of later AB daughters.

Number of daughters in first AB proof.	Fraction of superiority repeated in later AB daughters.
10	.46
20	.63
50	.81
500	.98

*Cornell Extension Bulletin 999.

When a bull has 50 artificial

Reprinted by permission from Guernsey Breeders' Journal, Petersborough, New Hampshire

daughters, one can begin to predict with fairly good accuracy what the next artificial daughters will produce. The student of breeding will use this new tool to a greater extent in the future. The artificial proof, or the artificial daughter average, is certainly more reliable than the natural proof. This is reasonable, as the artificial proof, or artificial daughter production average, is generally made on several farms, while in most cases the natural proof is made on a limited number of farms. Any bull that has been used extensively in artificial breeding should have an artificial proof. These can be requested through your Extension Dairyman in charge of DHIA work in your State.

In breeding dairy cattle for production and type, we need all the information available. In buying bulls, the information which the Performance Register gives is frequently overlooked. In addition to information given in the Performance Register, do you get all the Dairy Herd Improvement records available? Many times this added information will give you facts to make a sounder judgment on your selection of cattle.

To make sound judgments in the selection of cattle, we need to know a lot about the mass of cattle rather than a few individuals in a pedigree. One illustration of this might be—How many proven sons did the sire of your bull have? How many of them were plus proven? At what level did all the daughters of these bulls produce? We need to get many facts together so we do not have to cull so many cattle because of low production.

Feeding is important, but not as complex as many people try to make it. If we would adopt the practice of "all she wants to eat," many dairymen would increase their production.

High quality roughage must be stressed in feeding dairy cattle. The concentrate ration must supplement, not take the place of, high quality roughage. Many dairymen make their concentrate rations complex and costly, when they should depend on research and keep their rations simple and cheap.

It takes less time to do a thing right than it does to explain why you did it wrong.

Many cows sold for dairy purposes should actually be listed in the low production figures. Too frequently, many cows are sold from herds because someone offers a good price for the tops, and many times this sets the herd breeding program back many years.

Udder trouble makes up almost 13 per cent of the cows leaving home. To cut down on udder trouble we should have a mastitis testing program. This includes the use of the strip cup, udder palpation, and laboratory tests to determine nonclinical cases negative to normal tests. The strip cup is not only a diagnostic tool, but when used with udder massage, it has a great effect on milk letdown, so necessary for healthy udders. The taking of a couple of streams of milk from each quarter will certainly help milk letdown, as well as improve the quality of milk.

More than two-fifths of the world's population over 15 years of age is illiterate.

Organisms causing the trouble should be identified in the laboratory. Following the advice of your local veterinarian, after proper diagnosis, recommended drugs and other antibiotics can be used to treat each case individually, thus removing a lot of guess work. Again, it should be stressed that a competent veterinarian should be used on these mastitis control programs. Otherwise, many times, money is wasted unless we have a good control program.

We should be sure that the bull and dam we use will have daughters with the right kind of udders, strongly attached, and not pendulous. In the milking machine age we need udders that milk out in a reasonable time. Make inspection of the living animals that appear in a pedigree, if at all possible.

A sound program of managed milking should be followed in the dairy project. The cow should be treated as a lady, and one must remember she is a creature of habit. The udder should be massaged with a damp cloth, or paper towel, and a few streams of milk taken from each quarter. Research work at Kansas State University has shown that taking four streams of milk from each quarter, with no massage, resulted in faster milking than when massage was used without fore-milking. In other words, fore-milking provided a stronger stimulus for milk letdown than massage. Udder massage, combined with fore-milking, was more effective in stimulating milk let-down than either massage or fore-milking alone.

Starting the milking machine one minute after stimulating letdown shortens the time necessary for milking. It is important to milk fast, since the letdown hormone acts for only a few minutes. For effective stripping with the milking machine, pull the

teat cups down part way and massage each quarter with a gentle downward motion. This will quickly remove the rest of the milk. Remove the machine as soon as milk flow stops. Milking machine manufacturers' instructions should be followed on vacuum and pulsations. Vacuum should be checked frequently. If mastitis is a problem, many times the fieldman for the milking machine company can be of help. Proper housing and bedding, recommended for the area in which you operate, should be used. Many people in Kansas have found that after a loafing shed was built, and straw used as a "built-up litter" in the loafing shed in the wintertime, that mastitis was not as severe.

Anything that puts stress on dairy cows should be avoided. Recent research work indicates that cows in heavy production should have their feed intake cut at the drying off period to get milk production down to 20 pounds of milk a day, or lower. It has also been suggested that dipping the ends of the teats in a five per cent tincture of iodine twice in the first 24 hours of the dry period may have a lot of merit. Under no circumstances should cows be forced to run. Slippery walks, high sills, and other things causing udder injury, should be eliminated. Last, but not least, heifer calves should not be allowed to suckle each other. A high percentage of mastitis cases could be avoided by good management, and correction of management faults is a necessary part of any treatment program. Many times it is best to sell that chronic mastitis cow.

Sterility also takes a fairly large per cent of those cows leaving home. Disease certainly affecting the reproductive organs cause a lot of sterility. Such simple things as waiting 60 days after freshening before breeding will help to keep down sterility losses. Here are some points that will help to avoid sterility in dairy cattle:

1. Keep good complete records.
2. Never breed a discharging cow.
3. Consult your veterinarian if a cow fails to conceive to two or three services.
4. Have regular breeding-health checks of the herd by your veterinarian, and by all means include the bulls if you are using natural service.
5. Isolate cows which abort or show discharge.

About 30 per cent of all DHIA records in the nation are now being calculated on electronic computers.

6. Watch carefully for heat period. It is surprising how many heat periods are missed by dairymen.

7. Before discarding a sterile cow, make sure she is not in calf.

Many times, on killing floors, it is shown that the cow is pregnant.

It is good management to keep the cow in heat away from the milking herd where she has plenty of feed and water. This simple practice will help keep milk production up and will keep many cows from becoming crippled.

Paint containers should be properly disposed of. Fences should be properly grounded, as well as facilities around the barn. Insecticides should be used with care. In short, we should never become careless around dairy cattle.

A sound disease p r o g r a m should be put into effect on every dairy farm. A veterinarian in whom you have c o n f i d e n c e should be brought in to work very closely with you on your disease problems.

Good Rules Today

In 1882, a New Jersey farmer reported that "every employee on this farm is furnished with the following code of rules which he is expected to follow:"

Strive to excel in all you undertake.
Put everything in its proper place, and hang it up if you can.
Put nothing away out of order.
Do it well or not at all. Finish it.
As you sow so shall you reap. Sow only the best seeds.
Manure is money. Save it.
Cows — Milk clean and regularly.
With all animals, be kind and quiet.
Use no sticks, whips or stones.
Feed well and regularly.
Profane or obscene language or intemperance or idleness will not be tolerated.
Have a plan and follow it.
Borrow not.
Observe order, cleanliness and system in all things.
To become a good farmer is a most worthy ambition.

—C. K. Bullock, American Agriculturist

6 Ways To Boost Bean Yields

Check your practices against this list and make more money with beans . . .

Condensed from Capper's Farmer

Norman Reeder

1. Double Up The Rows

ONE sure-fire way to beef up soybean yields on most Corn Belt farms is to double the number of rows.

Midwest experiment stations show a bonus of 3 to 8 bushels or more per acre from rows 20 to 21 inches apart instead of standard 38- to 42-inch corn rows.

Most growers figure their usual acreage of soybeans isn't enough to justify special equipment just to plant and cultivate beans. So they stick to regular corn equipment and take a little less yield. But a few inventive farmers have hit on a system for growing beans in 20-21-inch rows without special equipment.

What they do is first plant in 40- or 42-inch rows. Then after they've controlled weeds for 10 days or 2 weeks, they make a second planting right between the rows already up.

Molgaard Brothers, Dallas county, Iowa, used this system to win the 1952 Iowa Crop Improvement contest with a soybean yield of a shade over 60 bushels per acre. They made first planting extra early, hit sprouting weeds with a rotary hoe just as beans were coming up. Then they cultivated to uproot deeper germinating weeds in the middle of rows and to make a seedbed for second planting. The in-between rows were planted at normal time in latter part of May.

This system doesn't complicate harvesting as much as you might think. Tests have shown that a 3- to 5-day difference in planting dates makes only 1 day difference in maturity. Beans respond more to length of day during growing season than to planting time.

Ralph Daniels, Hardin county, Ohio, double-plants every year except when his "intentions get rained out." In favorable years he says he gets a third more beans. In one bad drought year he showed only a 3-bushel in-

Reprinted by permission from Capper's Farmer, Topeka, Kansas

crease. But at that he paid for extra seed, machine cost and labor of second planting.

2. Grow Right Variety

Soybeans are fussy. Most varieties are extremely sensitive to length of day and do their best only in a narrow zone, north to south.

So for top yields you need to grow the variety proved best in your range of counties. Experiment station trials are constantly reshuffling varieties as new ones are put to the test. Check with your county agent for the latest recommendations.

Not so choosy are a few varieties such as Harosoy and Chippewa. They manage to come up with full yields or nearly full yields when grown over a considerable range south of the zone where they're best adapted. You might prefer these varieties if you want to get beans off early to follow with wheat.

Disease is a growing problem. It accounts for some of the older varieties now giving way to newcomers. A coming practice may be this: Planting a blend of varieties to get a compromise between highest yield and highest resistance to powdery mildew.

3. Knock The Weeds

Weeds cut soybean yields an average of 4 bushels per acre.

If you grow beans where the tussle is rigged in favor of weeds — say, on river bottom land or in fields where perennial weeds have dug in — you stand to lose a lot more.

The first 2 or 3-weeks after planting is the decisive time in the battle with weeds. That's true whether you depend on the rotary hoe and cultivator, or chemical weed killers.

Running the rotary hoe lengthwise over rows breaks the crust and helps soybeans up, while it digs up and flings seedling weeds to air and sunshine.

The hoe can be used to good effect two or even three times while bean leaves spread and shade the row where cultivator can't reach. Two or three cultivations later, the beans are usually in control of the field.

U. S. D. A. chemists report that tobacco smoke may contain as many as 300 to 400 different compounds.

Chemical weed control in soybeans isn't what it is in corn. Bean plants are more sensitive to chemicals that hit weeds hard. But we're progressing.

Randox, the grassy weed killer, and Alanap, are coming into fairly wide use. The sodium salt of pentachlorophenol (PCP) looked good in Missouri tests. Dinitro, neburon, and CIPC look

promising, too.

Even highly potent 2,4-D, at low rates of 1/16 to 1/8 pound per acre, has worked fine where weeds have formed a canopy over beans a week or two after emergence. Such low rates of 2,4-D are effective on sensitive weeds as ragweed, morning glory, and cocklebur. Better check with your county agent for latest chemical weed killers.

4. Check Lime, Potassium

Soybeans tend to pay back less from fertilizer than grain crops.

Even so, you won't get profitable yields from run-down soils. This crop stars at making efficient use of fertility left in soil from fertilizer put on previous crops.

Since soybeans need a sweet soil to grow their own nitrogen supply, you need plenty of lime to get full yields. So check with a soil test. You may find, too, you're low in potassium and phosphorus. Soybeans need a lot of potassium to make good-quality beans.

If in the past your bean leaves have turned yellow between the veins, it may be a manganese deficiency. Check with your county agent — he'll know if the problem is prominent in your area.

5. Inoculate Seed

As legumes, soybeans are able to get nitrogen they need from the air thru root nodules. But don't let that fact fool you. It's up to you to see that beans have the right bacteria in sufficient amounts to do this trick. If you don't, this crop will rob your soil of precious nitrogen and give small yields besides.

Keep this in mind: Soybeans dependent on nitrogen in the soil can use up more than any other crop. Nitrogen costs 10 to 12 cents a *pound*. For 10 to 15 cents *an acre* you can fix up this crop not only for its own tremendous needs, but leave a residue in soil for other crops.

Inoculating seed is quite a job — but worth it. The best way is to make a slurry with water and mix seed thoroly so every bean

When you can't remove an obstacle, plow around it.

carries several black specks. It's easier to inoculate dry — if you do, use double the amount of inoculant used for slurry treatment.

It's possible now to buy seed already inoculated — or to have your seed beans custom-treated. Bacteria stay alive for 2 weeks after treatment. Ask your local elevator about "Nitra-coat" treatment.

6. Slow Down Combine

A few weeks after harvest, some bean fields look as tho the grower has broadcast a fall seed-

ing. You're bound to lose some beans while harvesting, but you needn't lose that many. Losses add up — it takes only 4 or 5 beans on the ground per square foot to equal 1 bushel loss per acre.

Here's how you can stop such losses: Adjust reel speed to 1¼ to 1½ of combine. Slow cylinder speed to ½ the speed for other grain. Set cylinder-concave clearance at 5/16 to 7/8 of an inch. Spend a few minutes checking your combine instruction book for proper settings. It may pay better than any other time you spend with your soybean crop.

Raising Dairy Calves Presents Big Problem

The raising of dairy calves is one of the biggest problems among dairy farmers, W. L. (Bill) Northern, Extension dairyman at West Virginia University, said recently.

"Many dairy farmers do not spend enough time and feed on their calves. Consequently, the calves are smaller than they should be when they come into milk," Northern explained. "Calves and heifers should be fed and managed so they will freshen at 24-28 months of age without being too small. To accomplish this, the dairy farmer must get his calves to grow quickly by managing and feeding them properly."

Northern made these suggestions:

1. See that the calf is up and nursing within 1 hour of birth.
2. Feed dam's colostrum for 3 days.
3. Feed milk regularly at a temperature of 90 to 100 degrees F. from sterilized equipment.
4. Do not overfeed the calf.
5. Feed the same amount morning and evening.
6. Place a small amount of calf starter ration and green, fresh hay before the calf daily after the animal is 4 days old.
7. Provide clean, fresh water at all times.
8. Provide minerals.
9. House calves in a clean, dry, well-aired barn, but free from drafts.
10. Calves 3-12 months of age should receive 4 pounds of 14 per cent protein grain per day, all the good-quality hay they can eat, and a few pounds of silage.
11. After the calf is 1 year of age, the grain may be omitted if excellent hay and silage are fed or excellent pasture is provided.

—West Virginia University

The "Face" Fly: New Livestock Malady

Control is difficult. Frequent use of repellents is the suggested protection . .

Condensed from The Shorthorn World

INVASION of sections of the United States by a new pest closely resembling the ordinary housefly but centering its attack principally on livestock, has been reported by the National Pest Control Ass'n.

Dr. Ralph E. Heal, executive secretary of the Association, said the new pest, Musca autumnalis, has become a pest on animals from Vermont to Wisconsin and as far South as West Virginia this year, resulting in reduced weight gains of beef cattle and decreased production from dairy cows.

Known in Europe as the raven fly and in Canada as the black bush fly, this new pest is commonly called the "face" fly in the United States. The Association has had only a few reports of annoyance to humans, but warns that this fly may become a household pest. When cold weather comes, these flies seek shelter in buildings and other protected areas. Thousands may hibernate together in recesses about windows or in attics. Although they are trouble-some when they enter such situations, they are serious nuisances in the spring as they emerge from their winter's hide-away and nest around windows or on sunny walls.

Adult flies usually gather in large clusters on the faces of animals, especially around the eyes and nose. They suck available liquids and irritate the eyes, causing swelling and tearing. Nostrils, mouths and other moist surfaces are also attractive to the pest. The adults seek fresh blood from wounds, scratches or bites caused by other insects, but are unable to inflict such injuries.

Nothing sets a person so much out of the devil's reach as humility.

In some instances as many as 1,000 such flies have been found on a cow. Usually the adult flies are found in bright open areas, especially on light-colored sur-

Reprinted by permission from The Shorthorn World, 16 South Locust Street, Aurora, Illinois

faces. Males congregate in the sun on fences, walls or trees.

"The irritation by these flies to the eyes and other delicate tissues is sufficient to cause considerable swelling," Dr. Heal said. "It can reduce the weight gains of beef cattle and decrease milk production of dairy cows. There is some evidence that a disease, such as pink eye or conjunctivitis, is mechanically transmitted by the flies from animal to animal."

The "face" fly occurs in Europe, including Great Britain, as well as India, Israel and China. It was first found in North America in 1952 in Nova Scotia, Canada. The following year it was reported in Long Island, N. Y., Dr. Heal said.

Tests show that eggs stored for 100 days at 38 degrees are of the same quality as eggs stored for three days at 98 degrees.

The Association reports that in 1958 the fly occurred in small numbers in Ontario, Canada, Virginia and Ohio. In 1959 it has become an important pest on animals in New York, Ohio, Indiana and Illinois, and in sections of several neighboring states. This has been a phenomenal, almost explosive, increase both in distribution and numbers of the "face" fly in a single season.

This new insect pest, while it closely resembles the ordinary housefly, is usually larger, but it requires a specialist to distinguish between the two species.

Both sexes hibernate in large numbers in buildings. The eggs are laid on tiny stalks over patches of cow manure. The yellow larvae, when mature, move into soil to pupate. Adults are active from early spring to late autumn, but the number of generations is not known.

The accident death rate in agriculture as a whole is decreasing, except in the farm tractor category which is increasing. Nearly 20 per cent of tractor accidents are occurring on highways.

In the case of annoyance to humans it appears that these flies are attracted to the wet skin of bathers or perspiring workers.

Control of the insect is difficult because several residual insecticides, which would probably be effective, cannot be used on dairy or meat animals soon to be slaughtered. Frequent applications of repellents may protect the animals, Dr. Heal advised.

Manure Is Worth $500

Finely shredded and evenly spread manure is the best — and sometimes the least appreciated — soil-builder on your farm . . .

Condensed from New Holland Grassland News

LOOKING for a bargain in fertilizer?

There's no need to look any farther than your own farmstead. The greatest bargain you'll ever find in fertilizer is manure.

Or it should be. Trouble is, many of us miss out on the full value of this great bargain by taking the attitude that "Manure is manure." You load it; you spread it. And that's that.

Actually, manure is a highly perishable as well as valuable commodity. Unless we use the best possible management practices, we're not getting the most out of it.

With a proper handling and application program, manure can be worth at least $500 annually to the average farm, according to the U. S. Department of Agriculture.

The experts figure, however, that about half of this value is now lost before the manure gets to the field.

Major losses result from:

1. Failure to retain the liquid portion.
2. Improper fermentation and drying.
3. Leaching from storage piles exposed to the weather.
4. Failure to disk or plow in the manure as soon as possible after spreading on croplands.

These losses mean just so many more out-of-pocket dollars spent for commercial fertilizers to maintain top production.

Perhaps you're in the habit of thinking of manure as old-fashioned. Or, at best, as a supplement to commercial fertilizers. The soil scientists tell us it is really just the other way around. We should think of chemical fertilizers as supplementing our manure program.

One scientist bluntly states that "fertilizers should be used in addition to manure only if profitable increases in yields are obtained for the applied fertilizer."

Hardly anyone can expect to get top production from manure alone. But by making every effort to retain as much of the manure's

Reprinted by permission from New Holland Grassland News, New Holland, Pennsylvania

full value as possible you cut commercial plant food requirements to a minimum.

And let's not forget that manure does more than just put nutrients back into the soil. It's a top-flight soil conditioner. The humus that manure supplies improves the physical character of the soil by increasing its capacity to take in and hold water. It also improves its aeration.

Manure helps to make iron, manganese and phosphates more available to your crops.

Manure improves the tilth of soils that are too light or too heavy.

Areas where some topsoil has been lost by erosion can be brought back by a good manuring program.

Use of manure can save the cost of buying potassium fertilizer for certain soil situations.

Four to eight tons of manure per acre generally will supply enough potassium for corn on most Iowa soils, according to Agronomist Lloyd Dumenil of Iowa State College. Commercial potassium fertilizer should seldom be needed on fields receiving manure regularly, he says.

The value of manure as a mulching material on corn was shown in experiments in Ohio. Strawy manure used as a top-dressing on corn after the first cultivation increased corn yields more than did equal amounts of manure plowed under before planting.

Yield differences in favor of top-dressed manure were found greater in dry years — indicating the moisture conservation advantages of a manure mulch.

Surface mulching with manure also reduces soil blowing on coarse-textured soils, the agronomists tell us. The clumps of manure break the force of the wind on the bare soil.

Freshly shaped and seeded grass waterways respond best when given a top-dressing of manure, according to USDA soil scientists. Soil washing within the waterway will be reduced and a better stand of the seed will be promoted by preventing excessive soil drying.

In ten years, there may be a one-sixth gain in population. If better diet trends continue, farm output may have to be 25 per cent higher.

Soil losses from runoff on a 12-per cent slope in Zanesville, Ohio, were cut from 41 tons an acre to 1.4 tons by top-dressing with manure. Rainfall loss due to runoff was cut in half when manure was used.

A ton of dairy manure is worth nearly $7 for its nitrogen, phos-

phoric acid and potash. But unless you handle it with the respect it deserves, half of that value is lost before the manure gets to the field.

Here is the best available advice on the proper handling of manure:

Prevent loss of liquids by having tight barn floors and gutters. Use plenty of bedding to absorb the liquids.

Reason: Nearly three-fourths of the potash and one-half of the nitrogen are in the urine. Much of the nutrients in the solid excrement is water soluble and easily washes away.

Heifer dairy calves saved for herd replacement should be housed in pens opening to an outside exercise lot during the winter. These lots should be well drained or paved.

Prevent fermentation by the use of superphosphate. Spread it in the stable gutter.

Reason: Fermentation allows nitrogen to escape as gas.

Superphosphate adds to the fertilizer value of the manure, so it is money well-spent.

(If you find the use of superphosphate causes pitting in the concrete floor, cement specialists recommend coating the floors twice a year with low-cost water glass (sodium silicate'.)

Farmers with automatic barn cleaners can haul manure directly from barn to field with ease. But for those who load by hand, some kind of storage usually is necessary — and here is where additional nutrient losses occur.

To cut these storage losses to a minimum:

Compact the manure well to keep out air.

Keep it moist.

Keep it under shelter, if possible, to prevent leaching from rain.

Leave the manure undisturbed until ready for spreading.

Light, frequent applications (four to eight tons an acre for dairy manure) bring better returns than heavy, infrequent treatments.

Manuring, like every other farm practice, is only part of a coordinated, over-all program. It is no substitute for a good cropping system or proper cultural practices.

Experiment Station tests show it makes little difference to the health of grass whether nitrogen fertilizer used is a quickly available or slowly available form.

Ten Training Rules To Teach Your Dog

A how-to-do-it article to help you get more help from your dog . . .

Condensed from Wisconsin Agriculturist

WHEN you bring a new dog to your home or farm, it's as memorable as adding a newcomer to the family. But young pups have to learn the ways of the canine world.

In training your dog, you have to speak from the heart and let him know you're sincere.

Your commands should be short, distinct and consistent. And don't ask a dog to do senseless things; you'll want to keep his respect as well as his love.

Lessons should be short. Constant, brief ones — daily — are far better than irregular long ones. It's also wise not to train your pup when he's tired, or work him to the point of boredom.

End With A Reward

You should quit each lesson on a successful note, and top it off with praise and a reward. Never stop at failure. If necessary, go back to some command he's already mastered, to insure ending the lesson well.

What to teach is the meat of his training. First of all, it's essential that he comes when you call. This should be the easiest thing he'll learn; it's probably what he wants, anyway.

Go out to the yard — or some such area — where he can have some freedom. He should be wearing a collar; you should have a lead with you.

Walk about for a few minutes, letting him play freely. Then when he's some distance away, call "Here Duke" (or whatever his name is) leaning over and clapping your hands at knee level to further attract attention.

If he responds quickly, pat him and say, "Good boy."

Repeat this two or three times in the next 15 minutes and call it a day. This should do it, but if there's inadequate response — perhaps he was distracted in his play — call while running from him.

Housebreaking — or better yet "house-training" (never break a dog's spirit in any way) — should also be done easily; dogs are naturally clean. As a prelude, be sure your dog has ample op-

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portunity to relieve himself outdoors before you bring him in. This gives him the idea that he was taken outside for that specific purpose.

Later you may find — happily — that when he needs to relieve himself, he'll move toward the door. But if an "accident" happens, get to him quickly and rush him outside, anyhow, saying "Shame, Roy, shame." He'll get the idea.

Getting back to commands — one of the most important you can teach is to lie down, and stay until he has perimssion to move. It makes for good control.

Begin by calling him, patting him and then — after a momentary pause — say "Down Roy," quietly and firmly. Naturally he won't understand at first and will probably look at you quizzically.

Repeat the command — this time pressing your hand on his back. If he yields easily, that should do it; if not, increase the pressure. When absolutely necessary, pull his front legs out from under him. Once he's down you'll have to keep the pressure on his back until he gets the idea.

Repeat Commands

Gradually repeat this procedure until he gets down by command only, lessening pressure as you go along.

You'll probably find your dog eagerly responsive — it's a natural trait. But he might be too enthusiastic. You'll want to curb him from jumping up at people.

When he jumps up at you, hold out your hand — palm downward — and command "Down Roy." When he drops, be sure to reach down and pat him, to indicate that you appreciate his response.

Another rather essential command "Whoa!" — stop and stand still, used when your dog is ahead of you, or about to cross a street. For many types of hunting dogs, it's the most essential command.

To teach him this, you'll need a long lead — a clothesline will do. Just before mealtime, have the dog's food ready. The idea is to start him off toward the food, which is placed beyond the length of lead. As he runs to its length, yell "Whoa!" He'll get the idea very nicely.

Charles Darwin once raised 82 species of plants from seeds contained in the dirt clinging to feet and legs of freshly killed partridges.

After he learns to stop at your command, the next thing to teach him is "heel," or walk sedately just behind you — on the left side — with his nose at a line with your knee.

Any short lead helps in this lesson, but a rolled-up newspaper will also come in handy.

Walk along with the dog on lead. He'll naturally pull ahead. Say "Heel, Roy," stopping short, and with the lead pull him back to the heel position. When you start up again, restrain him from pulling ahead.

Reach slightly in back, placing him in lead position. If he persists in moving up, tap him on the nose with the newspaper. With patience, he'll soon be heeling at your command.

Americans have more time saving devices and less time than any other group of people in the world.

You'll probably also want to teach your dog to fetch. Chances are, he enjoys playing ball, and readily realizes that you won't play unless he brings the ball back to you.

Practice Game Daily

If you practice this game daily, holding the ball to his face each time before you throw it — saying "fetch" — he'll learn a healthful and happy new activity.

Later, add other objects, "fetch stick," "fetch slipper" and so on, to complete the lesson.

One possible dangerous habit that must be averted is a dog's love for chasing cars. You'll need the help from a friend, and a seltzer bottle or a pail of water for this one.

Have your friend drive by your house, with you in the front seat, out of sight. If Roy jumps out to chase the car, hit him with the water as he pulls alongside. It may seem like a nasty trick, but it's an extremely important one.

Training takes patience and understanding. At times, firmness will be necessary. But remember — what your dog learns is for his own good. A disciplined dog is a safe and happy one.

A continuous supply of fresh water for laying hens will pay off in higher egg production. Researchers found that pullets drank 25 percent more water during freezing weather when it was available to them at all times. Egg production increased by as much as 20 percent.

When done by hand, watering consumes about a third of the time spent in caring for chickens. An automatic water supply eliminates this time-consuming chore. —*Oregon State College*

For That Spark Of Life From Your Battery

Observe these rules to keep your battery in shape this winter . . .

Condensed from Tractor Farming

AN electrical failure can tie you up just as surely as a mechanical one. Your storage batteries are probably the most often neglected — and yet the most critical — single components of the equipment you have.

Here are a few pointers you may already know, but which are reviewed here because of their vast importance to you as an equipment user.

Basic Information

Your battery is not the source of electricity but only a storage reservoir for use when the generator is not running. In starting, for instance, the battery supplies the energy, but as soon as the engine starts, the generator begins to replace the electricity taken from the battery. Electrical energy in the battery is obtained through chemical action when the battery is in good condition and the generator is working.

Observe These Faithfully

1. Keep battery cable terminals clean and tight. Use hot water for cleaning the top of the battery. Brighten terminal contact surfaces with steel wool, grease them with heavy oil or grease, and reassemble. Be sure terminals are clamped tightly and that battery is fastened securely in battery box. Replace worn cables. Keep vent holes in filler caps open.

2. Keep electrolyte (acid and water) in each cell at star level at all times to prevent battery damage and failure. When below this level, pure, distilled water that has never been in a metal container should be added. If your battery has automatic liquid leveling devices, follow directions furnished with battery. Keep pure, distilled water (obtainable at drug store and service stations) on hand in glass or plastic

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jar for battery use only. Use clean syringe when adding water, and be careful not to allow dirt or corrosive salts to enter the cells. Acid or electrolyte should never be added except by an expert. Never add any special battery "dopes," solutions, or powders.

3. Test battery once every two weeks during heavy use periods to determine the specific gravity in each cell. Specific gravity of the electrolyte indicates the relative condition of the battery charge and warns when you may have to recharge your battery. Specific gravity of a fully charged battery is 1.240 to 1.260 corrected to +80 deg. F. (liquid temperature). A specific gravity of *at least* 1.220 corrected to +80 deg. F. should be maintained. Never allow battery to fall below this.

Specific gravity reading will vary with the temperature of the electrolyte. For readings taken at any other temperature than +80 deg. F., a temperature correction must be applied. This is done by adding .004 specific gravity for every 10 deg. above +80 deg. F. Here are some examples:

A. Hydrometer reading 1.284

Electrolyte temperature +20 deg. F. Subtract .024 Specific Gravity (.004 x 6). Corrected Specific Gravity is 1.260.

B. Hydrometer reading 1.252

Electrolyte temperature +100 deg. F. Add .008 Specific Gravity (.004 x 2). Corrected Specific Gravity is 1.260.

Use an accurate hydrometer to test for specific gravity. Don't test immediately after adding water. All cells should show approximately the same reading — wide variations mean something is wrong.

Beware Cold Weather

A fully-charged battery is especially important in cold weather. The electrolyte in various stages of charge will start to freeze at these temperatures:

Specific Gravity (Corrected to +80 deg. F.)	*Freezing Temperature*
1.250	—62 deg. F.
1.200	—16 deg. F.
1.150	+5 deg. F.

These are the approximate temperatures at which the first ice crystals begin to appear in the solution. A battery at 1.250 (better than three-fourths charged), is in no danger of damage from freezing. It's a good idea, then,

People living in the tropics average 3,000 calories per day intake, those in polar regions, about 5,000 calories, assuming that food is available.

to keep your batteries better than three-fourths charged, especially in winter.

Here are some important points in winter maintenance:

1. Add water to battery in freezing weather only when the engine is to operate for several hours to thoroughly mix water and electrolyte, or water might freeze.

2. Check battery at least once a month for electrolyte level and Specific Gravity. If Specific Gravity is too low, battery should be charged immediately. Fully charged batteries not only last much longer but are always ready for instant use.

3. If engine is not to be operated for some time, it is advisable to remove battery and store in a cool, dry place above freezing (+32 deg. F.) Place battery on a rack or a bench.

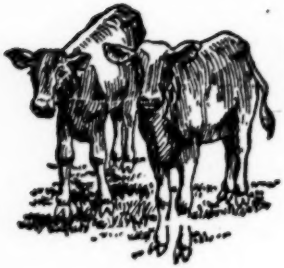
4. When replacing battery, make certain the cables are connected correctly to maintain proper polarity.

Because a storage battery is an electro-chemical device and because chemical actions are retarded by lower temperatures, the ability of a fully charged battery to crank the engine in cold weather is greatly reduced. For every degree the temperature drops, the storage battery loses some of its efficiency — around 0 deg. F. the usable energy in a fully charged battery may be only 60 percent of normal. Avoid trouble by maintaining the battery in a fully charged condition, and use recommended lubricants to "winterize" the engine plus a regular tune-up procedure to maintain the engine in top condition for quick trouble-free, cold weather starting.

Forty-five out of each 1,000 eggs produced are never sold or eaten according to a survey. Of these forty-five eggs, twenty-five are lost on the nest and twenty were lost during cleaning and packing. The reasons most often cited for the losses on the nest were (1) inadequate nesting materials, (2) too few nests, (3) careless frightening of birds, and (4) too few daily collections.

Accurate record keeping not only spots unprofitable cows in a dairy herd, but it helps locate cows which are being overfed. Feed costs should run only about half the cost of producing milk.

Can We Feed Heifers To Breed At An Earlier Age?



How to get more productive life out of your dairy heifers . . .

Condensed from The Ayrshire Digest

William Hansel, Cornell University

DID you realize that an average cow in any of our leading dairy states stays in the herd for less than three and one-half lactations?

During this time she must produce enough milk to pay for her maintenance as well as the cost of raising her up to the time of first calving before she makes her owner any profit. To increase the productive life of the average cow we can either bring her into production earlier in life or keep her in the herd longer.

Increasing the longevity of our dairy cattle is certainly a worthwhile project and animal scientists are striving to do this by better selection and feeding methods and by finding ways to reduce the number of cows culled as a result of mastitis and sterility. Nevertheless, progress in increasing longevity in dairy cattle is almost certain to be slow.

The average figure of three and one-half productive lactations per cow is not likely to be increased rapidly because it reflects to such a large extent heifers culled for low production during or after the first lactation, and this culling must continue. These facts emphasize the economic importance of having heifers calve as early in life as possible. At the same time they must be large enough at calving time so that calving difficulties are avoided.

High Levels Of Feeding Hasten The Occurrence Of First Estrus

An experiment conducted at Cornell University shows that it is possible to gain at least one-half lactation in the productive life of the average dairy cow by

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following a system of heavy feeding and early breeding. In this experiment Holstein heifers raised on a medium feeding level approximating the total digestible nutrients recommended in current feeding standards were compared to heifers raised on a low level amounting to 61 percent of the medium level and a high level amounting to 129 percent of the medium level. The growth rates of heifers in these three groups were markedly different. Representative groups of these heifers were slaughtered at 16-week intervals to study the effects of the three feeding levels on the development of the reproductive organs and other glands. The heifers on the high level of feeding came in estrus for the first time at slightly less than 9 months of age, those on the medium level at 12 months and those on the low level at 17 months.

High Fed Heifers Can Be Bred At Their Second Heat

Many heifers throughout the country are raised on feeding regimens approximating the high level used in this experiment. There is nothing to be gained and a great deal to be lost by waiting until heifers raised in this way are 15 or even 18 months of age before having them bred. If the average high-fed heifer on this experiment has been bred the second time she came in estrus she would have calved at about 80 weeks of age, at which time she would have weighed over 1,100 pounds exclusive of the weight of the fetus and the placental membranes. The reproductive tracts of these high-fed heifers were entirely normal and apparently completely functional despite the early age at which first estrus occurred. There is no reason to expect that these heifers would not be of average fertility if bred at the second estrus period. In fact, a limited number of high-fed heifers have now been bred and have conceived at the second or third heat period.

Medium Fed Heifers Can Be Bred At Their Third Heat

Heifers fed on the medium level did not show first estrus until nearly 12 months of age on the average. If the average heifer on the medium level of feeding had been bred at the third estrus period she would have calved at 94 weeks of age and would have weighed over 1,100 pounds. In fact, it is unlikely that any calving difficulties would occur in medium-fed heifers if they were bred at the second heat period.

Delay Breeding Underfed Heifers

Heifers fed on the low level of feeding did not come in estrus until they were 70-80 weeks of age. Many of the high-fed heif-

ers could have calved before the low-fed heifers came in estrus for the first time! If these low-fed heifers had been bred at 75 weeks of age and continued to grow at their slow rate until the 114th week when they would be expected to calve they would have weighed only slightly over 800 pounds. Breeding heifers raised in this manner should be delayed several months and additional nutrients should be supplied during pregnancy if calving difficulties are to be avoided.

Estrus periods subsequent to the first one occurred with about equal regularity in heifers on all three feeding levels, and there was little evidence to indicate that the function of the ovaries was adversely affected by either under or over-feeding. In other experiments heifers raised on these same three levels of feeding have all required about the same number of services per conception. Fattening, to the extent that it will occur on feeding levels of 129 percent of those currently recommended, does not seem to adversely affect the fertility of dairy heifers.

At the same time there was a tendency in this experiment for more abnormalities of the ovaries and estrus cycles to develop in both the medium and high-fed heifers allowed to undergo many cycles without being bred. This is another reason for breeding heifers raised in this way relatively soon after their estrus cycles begin.

It is often said that heifers bred too early in life will be permanently stunted. There is now ample evidence to show that this is not the case. Even heifers which are too small at the time of first calving will grow to a normal size if given additional feed during the first lactation.

Although Holstein heifers were used in these experiments, similar differences might be expected in heifers of other breeds, but the actual ages or weights at first heat would of course be somewhat different. It is also assumed that heifers raised on a high or medium level until the time of first breeding will be fed in about the same way from breeding until calving time.

The Pacific Ocean contains enough salt to cover all U. S. a mile deep.

The final answer as to which of these three feeding levels is the most advantageous cannot yet be given, but many dairymen at present feed their heifers at the medium or high level or somewhere in between these two levels, and it appears that heifers raised in this way should be bred for the first time at the second or third estrus.

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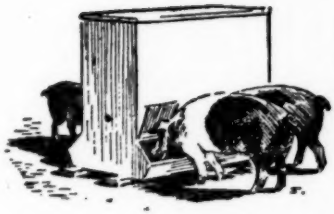
Start Off Right



If you are going in for pig breeding, it is important that you start right, says this English author . . .

Condensed from Pig Farming

Major C. J. Wheaton-Smith

STARTING in pigs needs careful planning.

Building, labor, equipment and capital available — all need working out, otherwise it's bound to be a hand-to-mouth sort of enterprise.

Equally important is the planning of the sort of pig you want, the breeding policy and the selection of stock. With a good layout and management it's hard to make a loss on pigs, but the amount of profit you make depends in the long run on the quality of your pigs.

Some types of stocking need little thought. For instance, if you rely for your stock on bought-in weaners, or on odds and ends of stores bought cheaply, then your worries are nil, and you can be content to play the pig market instead. Your profit is limited by the state of the market over which you have no control and on your astuteness as a buyer, but disease is your constant companion.

Next in the scale is a cross-breeding policy. This is probably the most profitable from the breeding angle. But cross-breeding demands exceptionally strong sows. In cross-breeding we expect larger and stronger litters, and we usually pick breeds with a reputation for extra good mothering ability. If, however, litters are larger and stronger, they will take more out of the sow during gestation and weaning. Therefore, the size and scope of the sow, and her inherited milking ability, become the most important factors in selection.

Rooting Out Records

You must find out, therefore, the size and weaning weight of the litter in which she was born, and, if possible, the result of her dam's other litters. If you can also find out how her sire's other daughters have done for litter size and weight, you have a good chance of selecting a successful dam. But there is no magic about cross-breeding. A sow that would

Reprinted by permission from Pig Farming, Lloyds Chambers, Ipswich, Suffolk, England

be a bad mother under pedigree breeding will be a bad mother under cross-breeding. And to be a successful mother she needs at least 14 teats.

By now the prospective breeder is launched on tracking down private and official records. But records are of little value if the environment in which they were obtained is not known. Fortunately, the pig-breeding cycle is short and it does not take long to find out mistakes. With a little care, spending perhaps an afternoon or two in asking questions, a great deal of money may be saved, or what is more important, much more money may eventually be made.

Length of Vertebrae

Present-day pigs have from 13-17 ribs and five or six lumbar vertebrae. The 13/5 animal is a short pig, and the rare 17/6 animals is a long pig. Length, however, is also determined by the length of the individual vertebrae and that is a factor to select for. However, long vertebrae that are fewer in number mean a weak back, and slipped discs.

If our sow for cross-bred litters is a bit short, it may be due to a deficiency in the number of bones or of the length of the individual bone, or both. This is a factor that will influence our choice of sire, as also will our policy of producing bacon or pork, or both. Pork is the easiest to breed for as bacon demands the longest boar available. There is a lot to be said for an intermediate policy of selling the male for pork and the females for bacon, since females grade better than males as baconers.

First-cross pigs make good mothers, but I have a prejudice against further crosses. Mothering results seem too unpredictable.

The hybrid vigor that comes from crossing black and white covers a multitude of short-comings; this extra vigor may not be very great if measured, for instance, as a percentage of extra growth. Most of the advantage is in extra health and vigor. Also, no one expects a cross-bred to look like a show winner, so they are regarded with a less critical eye. Perhaps their extra energy helps them to grow better hams than one would expect from looking at either of their parents. I have never felt that selection for size of ham was as essential in both parents of the cross-bred as it is in pedigree stock.

A cow's udder fills every 12 hours.

Choice of Boar

The question of what breed of boar to choose is not too difficult.

What is wanted is great length combined with depth of rib and an animal that wears well.

The size of litter the boar is out of is of little importance, provided the size of his dam's other litters are satisfactory. The weaning weights of her litters are important, as these largely depend on the milk potential she has inherited. A bad boar for milk can depress his daughter's milk yield and thus affect weaning weight in his grandchildren, even though other factors for growth are satisfactory.

Too much coarseness in the bone should be avoided, and he should preferably have 16 teats. The neck should not be too heavy. But a sloping rear can be regarded with some indulgence, as what is a show fault is not necessarily a commercial one.

The person who wants to do something finds a way, others find an excuse.

One of the most important figures to obtain for a boar is the growth rate to six months. This is the age at which all his progency should have been slaughtered, so it is the period we are most interested in. Growth rate and feed conversion go together closely, and growth rate can be used as a guide to feed conversion ability. But remember that during weaning much depends on the availability of the sow's milk, and afterwards on unlimited feed. So growth rates need to be looked at with an eye to management if they are to be interpreted correctly.

It is possible to run into trouble with too rapid a growth rate with baconers. Provided coarseness of bone is not a problem, food consumed may be deposited in the form of body reserves and this means fat and bad grading. Often such bad gradings are due to the pigman failing to pick out the really good converter to put on a lower plane of feeding.

This kind of trouble can play havoc with a breeding and selection program for most farmers would rather have less trouble and shove all the pigs through together and take a chance on a few bad gradings. Yet there may be a possibility worth investigating that the poor graders may be the best breeders for efficiency. On the other hand, it may pay — through cutting labor costs — to keep a slightly less efficient pig, and go for uniformity. With excessive uniformity, however, an end comes to selection for desirable animals that can bring improvement, and thus an end to progress.

The trend today is for efficient food conversion, and it may be

logical one day to revise the accepted weight for baconers, otherwise the curer may find over the years that he is buying more and more bone. Stepping up growth rates and eliminating fat can bring about this problem.

The really complex problems of selecting breeding stock arise when a pedigree herd — and, ultimately, pedigree stock sales — is the aim. This is a highly competitive field, and a hard one for a beginner.

Let Profit be Your Criterion

Would-be pedigree breeders tend to approach the question of choice of breed with their minds already made up. The top herds in each breed tend to be almost equally profitable. But the newcomer should choose the breed that offers the best chances of the highest profit as quickly as possible, which is naturally where there is the biggest potential choice of breeding stock.

If pedigree is his aim, it is absolutely essential that he should know the desirable type of pig, and keep clearly in mind exactly the type of pig he wants to breed and sell. Without this, his pedigree sales will not be worth considering.

It pays to look carefully at the ribs of breeding stock. It is in the rib red-bone marrow that 60-70 percent of the red-blood corpuscles are made, and a good rib is an indication of an efficient blood factory of health and vigor. Deep-ribbed pigs are not in fashion at the moment, but where essentials are concerned I don't think that one should be influenced too much by fashion. But with strong ribs, it is necessary to pay more attention to a finer neck, and perhaps not too heavy a shoulder.

The other points to bear in mind are: number of pigs weaned, pounds of bacon or pork sold per sow per year, hardiness, legs and back, mothering ability, docility and regular breeding.

If I were starting in pigs again, I would go to the slaughter plant and find out which herds were producing the best carcases. It might mean visiting several factories, but there is a wealth of information there if a friendly soul can be found to impart it. After all, it is in the factory's interest, as a prospective purchaser, not to be too close-mouthed!

Don't glean corn fields with the ewe flock, warn animal scientists. There is danger of foundering the ewes and also bruising their udders.

Study Environment

The next thing is to visit the herds chosen, size up the type

and variability, and assess the standard of management. It pays to buy stock from an environment similar to, or worse than, the environment you will be providing. "Hot-house" pigs don't do too well in the open, though hardy pigs improve under better conditions.

Don't be afraid to buy stock from families that may not grade uniformly well; provided they are long, and you think low grades are due to excessive feeding, it is one way of looking for good food converters.

The fewer records that are kept, the more difficult the task of selection. But, armed with a reasonable knowledge of breeds, it shouldn't be to hard to measure how much better than the average is the performance of the herd you are considering buying from. You have of course, to judge how much of that is due to inheritance, and how much to management.

About 50 foreign countries have 4-H clubs or similar organizations.

The same goes for the boar. You should not buy a boar which has taken more than 150-160 days (depending on summer or winter rearing) to reach 200 lb. liveweight. It is possible to get boars which reach bacon weight in grading condition in 130 days or so, but they are rare and expensive. I would not buy a young boar. Instead, I would look at all the old premium boars, due for retirement, and buy the one with the best records. I should then be able to compare the breeding merit of my sows and gilts against the progeny of a widely-used boar and thus have some chance of quickly discovering the breeding merits of my stock. Until this was done I should not go outside and look for another boar. If the old boar turned out well, I would be inclined to keep a carefully-selected sow; that would give me one line to work on, and help me to the day when I had a closed herd.

Essential records to be kept include fertility (regular breeding), fecundity (litter size), mothering ability (piglets born minus piglets reared), weight gains (for milking ability), growth potential (from weaning to slaughter), rate of growth feed consumed (for feed conversion) and rapidity of growth. Hand in hand with this, in a pedigree herd, goes length, strength, and soundness — and also beauty.

My second boar would come from a herd related to some of my best foundation females. Then, it might be possible to

close the herd though a closed herd can mean that one isolates oneself from improvements in the breed that could be got more quickly by buying in rather than by selection from home-bred stock. Uniformity of type provided one is sufficiently satisfied with one's type comes quickest with close breeding.

Improvement in the early days of breeding can be very rapid, and the selection needs to start at the slaughterhouse, and finish in the show pens.

Finally, there is one thing as important as anything else mentioned — foundation stock *must* be free of disease, particularly of virus pneumonia.

Can You Afford To Keep A Bull

What is the cost of maintaining a sire? Cost account records from Cornell University, and statistics determined by New York Artificial Breeding Cooperative, show this:

The annual cost of keeping a 1200 pound bull is $224.83. This includes $49.28 for hay, $72.27 grain, $15.00 bedding, $15.35 labor and $36.93 for costs (including interest, buildings, taxes, insurance and veterinarian).

The $224.83 will pay for breeding 30 to 40 cows depending on your breeding fee and conception rate. —*Southern Reporter*

WORTH OF MACHINERY — A farmer can figure out how much he can afford to pay for electrical equipment by considering the amount and value of the time the machinery saves. For example, if labor is worth $1 per hour and a machine saves 10 minutes per day, he can afford to pay $300 for the machine. At the same rate, he can pay $1,100 for a machine that saves 30 minutes per day and $2,250 for one that saves 60 minutes per day. These figures do not take into account the satisfaction some farmers get in taking it easy while machinery does their work. —*Louisiana State University*

Should You Rent or Own Your Farm

Rent or own? Both have advantages and disadvantages. Your decision should fit your individual case . . .

Condensed from Nebraska Farmer

Howard W. Ottoson, Nebraska College of Agriculture

THE decision as to what method for a farm operator to use to control land is not made by farmers every day. Rather, it is a long-run kind of decision which can be very important when a person is faced with it.

We will explore the nature of this kind of choice, and weigh the advantages and disadvantages of each kind of tenure arrangement.

When is a farmer faced with the choice between buying and renting? When getting started on his own, a young man may have to decide whether to invest his money in land and become an owner, or whether to rent land from someone else and invest his money in machinery, livestock, and the other things used in the farm business.

The operator who has rented his farm for some time may consider the possibility of buying his own farm instead. An established operator also may consider buying or renting an additional tract of land in order to expand his business. The increase in average size of farm year by year illustrates the extent to which farmers are making this kind of an adjustment.

The arrangements made within families, between fathers and sons, for example, represent a complex topic involving choices between ownership and leasing. However, because of their complexity, we will not discuss problems involving family relationships at this time.

Renting and owning land represent two alternative arrangements by which a man can gain control of land in order to use it. People sometimes are inclined to view tenancy as an arrangement which is socially inferior to ownership. However, this is not necessarily the case. Each is adapted to certain kinds of resource situations; there is no more reason why a desirable

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farm business cannot be based on leased land, than on land owned by the operator. In fact, it may be more economical and profitable to lease and operate a large farm than to own and operate a small under-capitalized farm.

We can illustrate this by looking at an actual case of a livestock share rented farm on good soil. This 280-acre farm was estimated in value at about $220 per acre. The major livestock enterprises are hogs and cattle feeding. These enterprises are geared to the utilization of home raised feed — corn, milo and hay. In 1957 the tenant's share of the sales, after deducting the cost of purchased cattle, amounted to $9,000. His net return to his labor and capital was $4,600. In addition to his labor, he furnished livestock worth $8,000 and machinery worth $8,000 during the year; his total investment was $16,000.

For comparison we budgeted an imaginary farm of the same type and the same enterprises as the above; however, we assumed an owner-operator with no more than $26,500 in his own capital to invest. If he paid one-half down he could buy a 120-acre farm for $13,500 of his own money, and would borrow a like amount, for a total of $27,000. Then he might need $5,000 worth of machinery, and put the rest, $8,000, in livestock. We estimated his net return in 1957, after paying the interest on his loan, at $3,200.

By operating a larger business, even though he owned a smaller part of it, the livestock share tenant in this comparison was able to net more, with a smaller capital requirement, than might have been the case of an owner-operator with more funds invested on a smaller farm.

Leasing Arrangements

Three basic leasing arrangements are used — the cash lease, crop share, and livestock share.

Youth is the happy time, but only age knows it.

Of these the crop share is the most popular, including the so-called crop-share cash, followed by the livestock share.

Advantages Of Leasing

Several advantages are associated with leasing in general as compared to ownership.

1) A man with limited capital can control a large business by renting land, and putting his capital into livestock, machinery, seed, and other resource items. Actually the long-run returns on land are not as high as commonly supposed. Other resources such as fertilizer for example,

may show an extremely high return by comparison.

2) Renting may enable a man to obtain the managerial assistance of an older, experienced landlord in some of the decisions to be made. If the farm is managed by a farm management company, young operators may benefit from the advice of professional farm managers also.

3) Renting leaves a farm operator in a flexible position to change farms, or to leave farming in case he is not yet sure that he wants to be a farmer.

4) Renting makes it possible to learn more about the soil resources found in an area, without committing money resources to a large fixed investment.

Disadvantages

1) Insecurity of tenure, because of the one-year lease, is one of the chief drawbacks of leasing.

2) Some landlords may have "pet" projects which may not be the most profitable enterprises as far as the tenant is concerned.

3) Improvements of an intermediate (3-5 years) or long-run nature often are discouraged on rented farms; the tenant may have no assurance of "using up" the improvement, or being reimbursed for unused investment; the landlord may not be able to visualize a return to his additional investments because of customary rental terms.

In addition to the above each leasing arrangement has certain specific advantages and disadvantages; these are:

Cash Lease

Advantages

1) Fixed rental payment allows tenant to "cash in" on superior management decisions and particularly profitable resource inputs.

2) Tenant has great freedom in decision making.

3) There is no problem of measuring the amount of the rental share.

Disadvantages

1) All of the risk of crop failure or price declines is carried by the tenant.

2) It may be hard to keep some landlords interested in the farm, as long as they receive rent.

3) It requires the most capital of any type of lease.

Occupation is one great source of enjoyment. No man, properly occupied, was ever miserable.

Crop-Share Lease (and Crop-Share Cash)

Advantages

1) The landlord shares many of the operations inputs such as seed and fertilizer.

2) The landlord shares some of the price and yield risks.

3) The rental varies directly with the productivity of the soil, for a specific share such as 2/5, 1/3, etc.

Disadvantages

1) The results of superior decision making are shared with the landlord.

2) The landlord will expect more voice in running the business.

Livestock Share

Advantages

1) Requires less capital than cash or crop share leases.

2) The landlord may be more interested in improvements and maintenance than under other leases.

3) An experienced landlord may be interested in providing considerable managerial assistance.

4) The landlord shares all of the risks of farming.

Disadvantages

1) If the landlord is not an experienced farmer the tenant may be sharing an undue part of his own management ability with the landlord.

2) Landlords tend to be interested in enterprises which commit the tenant to heavy labor use.

3) The process of joint decision making may be burdensome and time consuming.

There are variations in these leasing arrangements which have been suggested to reduce some of the disadvantages which we have listed. In the cash lease the *flexible arrangement* has a good deal of merit, although it has not been used much. It is a device to reduce risk by providing for an automatic increase or decrease in the amount of rental payment year by year to correspond to variations in general yield levels or prices. Such an arrangement must be mutually acceptable to tenant and landlord. Other improvements which have been suggested are:

Hospitality has been defined as the art of making guests feel at home when you really wish they were.

1) Longer term leases to give both the tenant and landlord a better basis for planning and carrying out resource investments.

2) Compensation arrangements whereby tenants will be reimbursed on a mutually accepted basis if he leaves the farm before these improvements have been made.

3) Sharing in returns in proportion to the variable costs incurred by tenant and landlord to encourage efficiency and more profitable production.

4) The use of written leases with tailor-made arrangements

adapted especially to each situation. Thus a livestock share lease should not necessarily be on a 50-50 basis, or 60-40, depending on the resource contributions made by each party.

5) The use of special rents to entice landlords to make desired improvements.

Owning The Farm

Most farmers have the goal of land ownership at some time in their career. Buying a farm is a very complicated matter, and the kind of decision it represents can have crucial effects on the success of the farm business for many years to come. What are the advantages of owning one's own farm?

Sure money talks, but nowadays you can't hold onto it long enough to start a conversation.

Advantages

1) Security of tenure. One can plan the farm operations in terms of the long-run.

2) Satisfaction of ownership. People take pride in owning land.

3) Managerial freedom. An owner-operator has great freedom of decision making, and of taking the consequences for these decisions.

4) The incentive to "keep the place-up" and to make improvements; the owner-operator may be challenged to spend time and money in enterprises and improvements in which a tenant-operator might not be interested — landscaping, shrubbery, etc.

Disadvantages

Certain disadvantages are also associated with farm ownership.

1) With limited funds an owner-operator may have too small a farm to exploit economies of scale, particularly with respect to machinery use.

2) There are limits beyond which volume of business cannot be expanded on a small farm.

3) A farmer may not be able to use his managerial ability to capacity on a small farm.

4) It is more risky to buy a farm under a mortgage than to rent it under a crop share or livestock share lease.

5) A man who has his money "tied up" in land may be limited on capital for the other resource items necessary to operate the business.

6) Buying a farm commits a person in a long-run sense to a particular tract of land. If the choice turns out to be a poor strategy — for reasons of productivity, change in economic conditions, or other unforeseen reasons — an owner-operator may not be able to change his position as readily as a tenant.

As we have suggested above, ownership is not a clear cut ten-

ure arrangement; rather there are different categories of ownership, just as there are different kinds of tenancy. First we may have the heavily encumbered owner-operator who has a mortgage which exceeds say 30 to 40% of the value of the farm.

There is no fundamental difference between borrowing money and borrowing (renting) land. In this case the creditor is the landlord; the commitments under which such an operator farms is very similar to those under a cash lease as far as the fixed payment and the associated risk is concerned. He is assured of continued operatorship as long as he makes his payments.

The moderately encumbered owner-operator (with a mortgage obligation of less than, say, 30% of the value of the land), owns a bigger portion of the farm and has a smaller source of risk due to a fixed mortgage payment. Finally we have the debt-free owner-operator who represents the image in the minds of most people when they think about owning land.

The type of creditor who holds the mortgage on the farm also affects the way in which a man operates his farm. The creditor who is primarily interested in receiving the mortgage payment and not in the operations of the farm may be very similar to the cash-rent landlord. On the other hand the FHA, which takes an active part in management decisions, would be more like the livestock-share landlord in its relationship to the operator.

The Time To Buy A Farm

When we look back at the past history of land prices and economic conditions, we can see that there have been "good" and "poor" times in which to buy land. Thus, farmers who bought land in 1919 or in 1928 paid high prices and, if they borrowed money, found that the mortgage payments became very burdensome. Many lost their farms; others, more fortunate had to renegotiate their loans.

A telephone pole never strikes an automobile except in self-defense.

On the other hand farmers buying land in 1939 or 1941 did so when land values were low but economic conditions were beginning to improve, and were able to pay their mortgages in half or less than half of the time originally planned. It appears that the 1920's would have been a particularly good time to be a tenant; the late 30's or early 1940's were particularly advantageous for becoming an owner even under heavy mortgage.

Unfortunately, predicting future prices is much more difficult than analyzing what happened in the past. Mistakes can be made by beginning farmers who try to outguess the land market. For example, many people (including economists), cautioned returning veterans not to buy land in 1946-47, because they felt that the land boom would soon end, and a depression would occur.

However, the farmers who bought land during this time operated profitably until 1952 and were able to pay heavily on mortgages. Of course the Korean incident, which no one could predict, came along in 1950 and kept agriculture from experiencing the depressed conditions which were becoming evident at that time.

We are not saying that a farmer who wishes to buy land should not study the facts concerning land prices; however, since we cannot predict the future, his own capital position, his objectives in farming, and the availability of the right farm with the ability to repay the purchase price should probably be more important in determining when an operator buys land than the general state of the land market.

Bad officials are often selected by good citizens who didn't vote.

Part Ownership

A development in farming which has taken place during the last 10 years is part ownership. A part owner is a farmer who operates both rented land and land which he owns, all as one managerial unit. Part owners come into being in several ways. A tenant may buy a 40- or 80-acre tract in the neighborhood which he then operates in conjunction with the whole place, or, an owner-operator on a small farm may rent additional tracts in order to achieve larger volume, and increase his income.

The notion of part-ownership illustrates the flexibility which characterizes modern farming. Ownership and tenancy are not c l e a r - c u t alternatives. They should rather be regarded as tenure tools which an operator can use to fit his own individual situation.

The Family Cycle

The decision as to whether to buy or rent ties into the notion of the family cycle in farming. The family cycle is a brief term symbolizing the stages through which a farmer and his family pass in their farming career. A young operator may start out with much ambition and willingness to work, but short on experience and capi-

tal. As time passes he becomes more experienced in managing the farm and accumulates capital. His growing family also represents a larger labor force. Thus he is able to operate and manage a larger business. As he gets still older he can expect to accumulate more capital, but his real labor supply diminishes as his family grows up, and he is not willing to exert himself as strenuously as before. However, his managerial ability continues to develop. Finally he reaches the stage where he begins to retire from active farming and to turn the business over to someone else.

Don'ts For Livestock Feeders

Don't withhold feed from young, growing animals when they want it.

Don't feed a ration containing corn alone to any class of stock.

Don't allow breeding animals to become so thin that you have to apologize for their condition.

Don't feed more grain mixture or concentrate than the animal will clean up quickly, except when forcing fattening animals.

Don't allow pregnant animals to become too fat.

Don't use pastures too early in the spring and don't graze pastures too closely.

Don't let animals go thirsty.

Don't forget to salt all animals regularly.

Don't feed animals of different ages and sizes in the same pen or lot.

Don't let strong and aggressive animals rob the weak of the proper amount of feed.

Don't turn cattle or sheep on luxuriant clover when the dew is on.

Don't put fresh feed into dirty or sour troughs.

Don't allow dairy cows and laying hens to become fat.

Don't waste your surplus feeds.

Don't feed frozen, moldy, or spoiled silage.

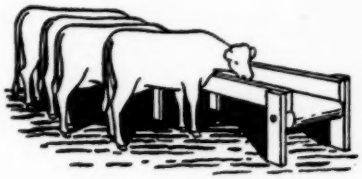
Don't change an animal's ration abruptly.

Don't feed animals poorly because they are not producing: feed them and give them a chance.

Don't keep scrub and inferior stock; they are wasteful of feed.

—Royster's Almanac

Loose Housing For Dairy Cattle



Low cost, high utility buildings for loose housing have many advantages . . .

Condensed from
Production-Line Farming
T. J. Rutherford, Director,
Veterans Land Administration
Ottawa, Canada

LOOSE housing, together with self-feeding, is by no means a new practice with beef cattle, sheep and hogs. With these it is the logical method and so simple a proposition that one finds it difficult to understand why the practice is not more universal.

As applied to dairy cows, it is comparatively new but is spreading very rapidly, and this for many very good reasons.

When associated with Grassland Farming, the properly constructed self-feeding bunker silo, the double-tandem walk-through milking room, and direct cow-to-can milking with or without a pipeline or tank, and when properly organized and well managed (both of which are very important), loose housing of dairy cows has the following advantages:

1. It will make it possible to produce cleaner milk with a lower bacteria count than is produced in most stanchion barns, however spotless they are kept.
2. It can cut average chore time by from one-third to one-half.
3. It should not increase, but may decrease, the amount of bedding required to keep cows clean and comfortable, provided good bedding practices are used and a good manure pack is built up.
4. Cows are healthier and the incidence of mastitis and injured teats is reduced.
5. It will extend, by several years, the average productive life of the cows in the herd — a very important item where a herd of high-producing cows has been built up.
6. Cows are much cleaner if the condition of their whole hide, as well as flanks, is considered. The necessity for

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brushing is also eliminated.

7. Since cattle are out in the open a considerable part of the time, they build up their own Vitamin D, which is lower in silage than in hay, thus making unnecessary the feeding of hay in addition to grass silage.
8. The value of the manure is higher, and manure may be handled at times convenient to the operator and to better suit the crops. Loafing pens are generally cleaned out in September. This gives cleaner silage and hay where manure is spread on meadows, as it should be for best results.
9. The danger of loss of buildings by fire is less, and the danger to livestock and stored silage if a fire does occur is almost completely eliminated.
10. Loose housing considerably reduces the capital outlay for buildings and equipment as well as the cost of maintenance, insurance and taxes. If it is necessary to construct new buildings, the investment per cow need not be more than 50% of that for a conventional barn and stable. If it is a case of converting existing buildings to loose housing — and this will often be the practical answer — the cost need not be high, but careful planning is most important in order to give the greatest economy in labour and equipment. Concrete tower silos should generally be abandoned in favour of the cheaply constructed self-feeding bunker silo. Lumber from a stave silo makes good sides for bunkers.

The essentials of a good loose housing set-up for dairy cattle are:

1. It must be well organized and well managed. This is most essential.
2. It should be readily adaptable in case a change in the type of enterprise becomes advisable.
3. It should be compact and convenient in order to save steps and make it economical to construct, to operate, and to maintain.
4. The buildings should give shelter to the paved yard.
5. They should be laid out in five separate and distinct areas, i.e., a bedded area, a paved yard, a self-feeding bunker silo, a holding area, and a milking area, all of which should be capable of expansion without altering the original buildings.

Agriculture And Professional Public Relations

Here is a thought provoking article farmers and others should read . . .

Condensed from New England Homestead

Carlton I. Pickett

IN MY time I have listened to hundreds and read thousands of professional opinions about better public relations for agriculture.

Farmers are disturbed over what they read about themselves in the editorials of some metropolitan newspapers, at the attitudes of some legislators, and at the lack of information about farm people and farm issues that is so prevalent.

There is nothing new about this desire for better understanding. The farmers have sensed the need for it for half a century and people who talk to farm groups constantly sell the proposition to them. They need it. They must have it. They will never get anywhere, say the professionals, until the public gets a better image.

The desire for what is known as public relations is a very human desire for better understanding. It is a hunger for a little love at the hands of society. It is a smoldering resentment against the stupidity of those who presume to shape the public thought. Those who produce America's food and fibre are particularly incensed at stories concerning Cadillac driving farmers, government subsidized farmers and the high cost of food.

There have been millions of words poured out in advice to farmers by the professional public relations people on how to overcome all of this and to explain it away. The experts furnish the figures on those who hardly exist in grubbing out a living on the land, of the countless businesses, industries, utilities and others who have been or are subsidized at the hands of government and of the shrinking number of minutes of labor required today to buy a better packaged food than grand-dad could in his time.

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Nwe England Homestead, 29 Worthington Street, Springfield 3, Massachusetts

To all of which we take some rather violent exception. We don't believe in explaining away things. Some farmers do drive Cadillacs and if that is what they want, more power to them. They have pink and lemon and pastel colored bath tubs too and let's cheer that as a class farmers have emerged from peasantry and are becoming successful businessmen.

There are living today perhaps a couple of million farm families who can still remember milking by hand in the poor light of a lantern. They have known farms with no electricity and none of the things that run by electric power to make the kitchen, the home and the farm a better place to live. The women still remember cooking in the oven of a wood stove and getting water from the well out in the yard and they all remember the Saturday bath beside the stove that they took in the old wash tub. The prices they got for what they did not eat of their farm production barely supported that kind of an economic existence but no more.

The American farmer will not produce for a pittance, will not exist as a nation that pays its laborers more cash in a week than some farmers used to see in a whole season. Today's farmer is entitled to anything he wants provided he can earn it.

Some farmers are subsidized by government and the politicians tell us that that is in the public interest. The best possible public relations on the subsidy question would be for farmers to more actively fight to get out from under political subsidies. So long as some farmers are perfectly willing to take part in a subsidy program "because if I don't, the other fellow will" — just that long will there be political subsidies and all the professional farmer-public relations experts in the world can't scratch dirt enough over that mess to keep it from smelling.

Food prices are high. They are too high. Farmers can explain it away but no housewife feels better at the super market cash register by being told she has just wheeled in a load of "built in maid service."

Cattle are money to many African tribes, even now. They would think no more of eating one of their animals, than you would of baking your favorite daughter for supper.

Nor do we believe that all of the semantic jargon of the experts is going to make farming, and farmers and farm issues look any better to the public. You may speak of "agri-business' or of a "public image" or of "value

patterns" and it still is a mess of double talk. Let me confess to a slight feeling of nausea at the mention of agri-business.

Somehow I just can't picture a feeling of real partnership between the farmer who totes in a few loads of cukes to the factory and the pickle king and his associates or of the milk producer back in the grassy green hills and the city shrewd milk dealer who skins him when he can. It is like trying to bed together Walther Reuther and the management of Chrysler corporation on a new type mattress called labro-business or putting a city banker and his mortgagees between the lavendar sheets of financo-business. It is a pretty conception but unlikely.

Neither do I particularly care to create a "public image" or a "value pattern." What usually happens is that the professional public relations people who can be employed by agriculture for a whacking good price succeed only in presenting the farmer and farming as a mirage.

Lightning does about 10 million dollars worth of damage yearly to U. S. farms.

It is far better to present the farmer as he is, vital, earthy, tremendously essential with great potentialities for good yet with some very human flaws in his make up that need no apology.

If we don't think much of campaigns to present the farmer who may be successful as an exception, to defend subsidies by pointing to subsidies for other people, to apologize for high food prices and shift the cost to labor distribution and packaging — then what in the world would we do for the farmers? How would we fill the very real desire for farmers to be better understood because after all we do admit that the farm population generally gets pretty rough treatment editorially and are misunderstood plenty.

I think that when we are dealing with America's farmers we should deal with them and not with the allied industries. Let the dealers, the traders and the middle men tend to their own self advertising. Second, no one can present anything but the truth. Third, what is important about farmers and farming to the non-farming public. Why should they care a hang about the farmer? What kind of a fellow is he anyway?

The country bumpkin, the floppy straw hatted yokel of another day and age went out of existence with vaudeville. The ignorant loutish man with a hoe of Edwin Markham's poetry has

vanished. In his place is a business man who expects to compete with the shrewdest in the business in the use of capital, land, labor and modern technology. He is a social force and an economic factor in the community in which he lives and should be recognized as such. He is politically alert and active. He is organized and more than most he steps in and guides his organization whenever he is not satisfied with it. He is independent of all the things that silence too many an industry and trade. He depends on no Government contract, no political favor, no sizable advertising contract, no labor agreement and no boss. He should be presented to the public as he is.

Is he so different today in America from any other class of men? Part of agriculture is a subsistence pattern and a social problem. It is not part of the true picture of farming, for agriculture today is a dynamic force and a farmer is not a man with a hoe but a man with gigantic modern machinery and thousands of airplanes dusting, spraying, fertilizing, transporting.

And the farmer himself? He is like as not a trustee in your local college, a member of the Board of your community bank, a speaker at tonight's Rotary Club.

Much has been made of the dwindling importance economically of farmers. Their growth in size and decline in numbers does not diminish their importance. It is good for agriculture and the rest of us. It makes for an efficiency that permits eventual lowering of the cost of food and it releases more and more men and women to do other things. Were it not for the technological revolution in farming that has taken place in the past forty years, some who are doctors and some who are scientists and some who are engineers and some who are educators would still be grubbing out witch grass on a stony New England farm to get enough for their family to eat.

Mr. Curry W. Stoup, Vice President of AVCO recently said at the Boston Conference on Distribution that "farmers have a spendable income of forty billion dollars, of which twenty-four billion dollars is spent for the business of farming and sixteen billion for family living."

The probable reason some people get lost in thought is that it is unfamiliar territory to them.

"Where else in the world would you find a market of farm families spending $37,500,000 for cosmetics, creams and lipsticks;

$46,000,000 for radio, TV and music; $45,000,000 for children's toys and play equipment; $23,000,000 for innerspring mattresses; $200,000,000 for coffee; $91,000,000 for canned goods."

"Where else in the United States economy can you find customers as solvent as the farmer. He owes only $11 for each $100 he has in assets. Two out of three of his farms have no mortgages and the most successful farmers have between 250 and 300 acres of land with an investment of $90,000 to $125,000."

"The people who run these 4,800,000 production units we call farms are entrusted with the most important of all — our natural resources — the soil. No matter how far we travel into space or what marvelous new sources of power we develop, we still have to eat and every day there are 7,000 more mouths to feed in this country alone."

Others may urge on farmers the desirability of explaining away the Cadillacs, the Government subsidies, or the high cost of food but I urge the farmer to stand up for his own, to make his importance known and felt. Let the rest of the people know that farm people expect to make money and intend to do so, that they expect to provide a vast market for goods and services that will make millions of jobs for non-farm people, that they expect to be strongly organized and to wield some influence as a pressure group in a nation of countless other pressure groups.

In this tough old competitive world of today some of the things that count are respect, prestige and importance, value (cash or nuisance), and a healthy chunk of votes with the determination and knowledge of how and when to use them. These, the farmer has. His very use of them is public relations. The American farmer creates his public relations day by day by what he does or does not do and by whether or not he does his best to tell it to the world. The farmer's organization that fails to recognize these things fails to accept their full responsibilities. Let's quit trying to explain away what is true and begin to tell the world about the modern farmer and his place in the economic, social and political scheme of tomorrow.

Purdue University agronomists point out that winter is an excellent time to lime fields seeded to wheat or intended for spring oats. Freezing and thawing work the lime into the surface of wheat fields. When the oats seed bed is prepared, the lime is mixed with the soil.

4 Steps To Cleaner Milking Machines

Is bacteria count your problem? Read this . . .

Condensed from Western Dairy Journal

Lyn MacDonald Allen

CLEANING is one of the most important operations on a dairy farm.

A good milk producer takes no shortcuts because sooner or later he will pay the price in a lower quality product.

What makes a good cleaning operation?

There are four separate steps: *rinse, wash, rinse* and *sanitize.* Leave any of these steps out and the others become less effective.

Step 1: First rinse your milking equipment just as soon after use as possible especially before the milk film can dry. Make this a thorough job.

Step 2: Wash to remove the thin film of milk solids that rinsing can't tackle. This means carefully scrubbing the equipment with a bristle brush in a detergent solution.

Step 3: Rinse again thoroughly with clean, fresh water.

Step 4: Give the milking equipment a sanitizing treatment. This kills most of the remaining bacteria. Sanitizing can be done by hot water or steam above 200 degrees F. Rubber parts can be treated by immersion for at least 15 minutes in water above 170 degrees F. Chemical sanitizers, available through dairy supply companies and used according to directions, may be used instead of heat.

Here are some important facts that every dairyman s h o u l d know about cleaning and sanitizing milking equipment:

1. Milk solids react with detergent and sanitizers and use up their cleaning ability. That's why rinsing jobs must be thorough, it will help reduce detergent cost.

2. Rubber is attacked by fat, loses elasticity and becomes swol-

Reprinted by permission from Western Dairy Journal, 4511 Produce Plaza, Los Angeles 58, Calif.

len and out of shape. Thorough cleaning can also help reduce replacement costs.

3. The life of rubber goods, like milking machine inflations and milk hoses, can be increased with proper cleaning. Periodically soak them overnight in double strength alkaline detergent.

4. In hard water areas mineral deposits called waterstone often collect on equipment. The alkalies in regular detergents won't cut these deposits, but they can be removed with acid cleaners. Acid cleaners and alkaline cleaners will neutralize each other. For best results, be sure all traces of one is removed befor the other is used.

5. Chemical sanitizers in common use include, the chlorine type, quaternary ammonium compounds and iodophores.

Herringbone-Type Parlors Offer Milking Advantages

Dairymen planning new milking facilities should take a look at the herringbone-type milking parlor.

Research has shown, says T. C. Blalock, in charge of dairy extension at North Carolina State College, that the herringbone system is among the most efficient ways of milking cows.

Herringbone parlors get their name from the fact that cows stand side by side, facing out at an angle much like the pattern of bones in herring fish. The operator works in a pit about 30 inches lower than the level of the cows.

Although there are several size parlors in use, Blalock believes the double-four parlor — two rows of four stalls each — is best for the average operator. The double-four parlor when combined with a pipeline milking system will give one operator plenty of time to do his work and allow time for normal delays.

The above average operator may be able to handle a double-five parlor. In fact, Blalock added, some operators may wish to plan for the fifth position when building the parlor. Then, when they gain experience they may be able to handle a double-five unit.

Blalock explained, however that in herringbone parlors the need for such things as udder washing must be kept to a minimum. Paved barnyards will be necessary to keep the cows clean.

Double-six units are not recommended for one operator even under the most ideal arrangements. Where two men are used, however, a double-six or double-eight parlor is recommended.

—North Carolina Extension Service

A chapter from the new Veterinary Instruction Manual, recently published by Farmer's Digest. Complete contents of this new book to sell at $7.00 will appear in your regular issues of Farmer's Digest.

How To Clip Baby Pig Needle Teeth

Detailed instructions to help you do a simple veterinary chore and grow more profitable pigs . . .

Editors of Farmer's Digest

AT birth, baby pigs have four long, sharp teeth on each jaw. These sharp teeth, in the forward part of the mouth, are usually black or brown in color, while other teeth are white. They are commonly called needle or wolf teeth. Longer and sharper than other teeth in the pig's mouth, they can be the source of considerable trouble in a litter of suckling pigs.

Pig needle teeth often cut into and irritate the sow's udder as the pig suckles, causing infection and injury. The sow may refuse to nurse pigs, limiting their food supply and causing runts or even death.

Long needle teeth are really small tusks and, if allowed to stay in the pig's mouth, can also result in pigs injuring one another. These long teeth or fangs are vestiges of the early wild boar. Pigs naturally use them to fight with unless they are removed. When fighting, pigs with needle teeth can inflict wounds that cause disease infections. Wounds about the head can permit necrotic, rhinitis and general infection to enter the body and cause fatal or near fatal illness.

Don't Wait, Clip Teeth Early

Baby pig needle teeth should be removed right after birth. Swine authorities recommend this step. If pigs injure the sow at first attempt to suckle, sows — especially gilts — may refuse the entire litter. Sows become nervous and may kill or injure pigs even though they allow nursing.

Some swine raisers mistakenly do not clip needle teeth because they believe the mouth and gums may be injured, allowing infectious organisms to enter the body. However, this mistaken impression was probably made by someone who performed this simple operation without proper care or instruction, leaving sharp stubs of teeth or bruising and cutting the pig's gums. For that reason,

Reprinted from The Livestock Veterinary Health Manual, published by Farmer's Digest, Fort Atkinson, Wisconsin

it is important that you follow our instructions carefully. If done properly, clipping baby pig needle teeth will not cause infections but actually help prevent them.

Prepare For The Job

Some hogmen remove needle teeth and also ear notch in the same operation.

To begin with, be sure you have the correct type of teeth nippers or pliers. They should be designed so that their sharp cutting edges give a smooth clean break. Never use a plier which leaves a broken, jagged edge which may sometimes be sharper than the needle teeth themselves and is apt to bruise or cut the gums. The ends of the cutting blades or nose of the pliers should be rounded and dulled, so that you will not inadvertently punch or cut the gums or mouth of the pigs.

For the same reason, the nose of the pliers or the cutting blades should not be too long.

Diagonal cut wire pliers have been used for clipping pig teeth for many years. However, a new tool especially made for this job is now on the market. It is slightly smaller than most wire pliers, chrome plated to aid sanitation, and equipped with a self-opening spring to facilitate one-hand use. Most important, however, these new pig teeth nippers are especially designed with relatively short and blunt cutting edges to avoid the possibility of cutting the pig's mouth and causing infection.

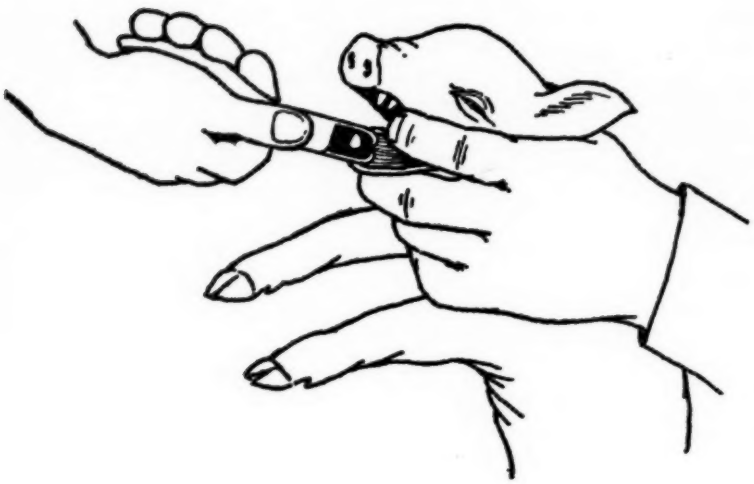
Before starting the operation, make sure the teeth nippers are clean and sanitary by scrubbing them in a solution of alcohol. If alcohol is not available, a good scrubbing in a hot soapy water solution will do the job. Soap and water is a satisfactory disinfectant if a liberal scrubbing is given.

How To Catch And Hold Pigs

Before starting to catch pigs for this job, it is wise to separate the sow from the litter and pen her out of reach of you and the pigs.

Small pigs can be easily caught by hand, but never hold pigs by the nose or tail. This causes them to scream and struggle, arousing the sow and making the other pigs difficult to manage.

Small pigs are best caught by seizing one or both hind legs and swinging or lifting them from the floor. At the same time, shift the hands, so that one supports the pig's belly just behind the front legs and the other presses down across the shoulders. In this manner, a pig can be placed with the rump under your left arm and held tightly against your body with your elbow, freeing the left hand enough that you



can grasp and hold the pig's head and shoulders with the left hand. Also, use the fingers of this same left hand to hold the pig's mouth open and expose the needle teeth. With the right hand, operate the teeth nippers.

Pig needle teeth are sharp enough to injure your fingers and hands, so use caution when placing fingers in little pig's mouths.

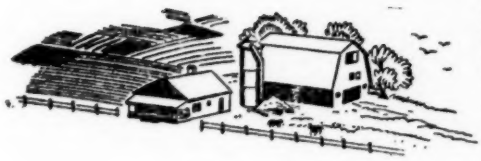
Now, Complete The Job

Now, you are ready for the operation. Remember, there are four needle teeth on each jaw of the pig, four on each side of the mouth and eight in all. Hold the teeth nippers as illustrated and with the pig held as shown to make the teeth accessible, clip the needle teeth level with the other teeth. Do not try to cut the teeth level with the gums. Clipping at the level of the other teeth helps greatly to avoid damage to the pig's mouth.

Clip to get a clean, smooth break with no jagged edges and no injury at all to the gums. Hold the nippers carefully and do not let the pig jerk to cut or bruise himself.

There is little need for treatment of the teeth and gums after nipping if ordinary sanitary precautions are taken. However, some hogmen prefer to place a drop or two of tincture of iodine on the teeth as an added precaution.

Agriculture Moves Into The Electronic Age



Computers may point the way to better management and higher profits . . .

Condensed from Humble Farm Family

THE farmer of tomorrow, taking his cue from a well-known literary character, may carry his problems to a complex electrical apparatus and plead: "Computer, computer . . . on the wall . . . which farm program is the fairest . . . of them all?"

With a minimum of effort and errors, and assisted by someone who can interpret "computer-talk," the consulted machine might reply: "Plant 45 acres wheat, 363 acres milo, 138 acres oats, 12 acres of hay, and keep 36 mother cows and 35 sows."

In just a short time the electronic "brain" would have determined the best estimate of requirements for producing maximum profit from the farmer's resources. It might have taken him several days with a pencil to decide the same problem, and even then he probably would wonder if he had made the right decision.

Such electronic programming brings to the farm the same pinpoint accuracy that scientists can obtain in shooting for the moon, that pilots can get in landing by instrument.

The day when a farmer or rancher is completely relieved of all decision-making will never arrive. He will always have to supplement or fill-in areas a machine cannot cover. No electronic brain will ever replace good common sense. Yet machines are already able to assist farmers in their decision-making.

The first farmer in Texas to get management help from an electronic brain in cooperation with the Agricultural Extension Service is Bernhard Neumann of Falls County. He began this fall to follow a farming and ranching course charted by an electronic machine at Texas A & M College. Agricultural authorities say Neumann is the first of many who will take advantage of an

Reprinted by permission from Humble Farm Family, Houston 1, Texas

"extra hired hand" for management. They say electronics may soon have as much impact on modern farms and ranches as in industry or military planning.

On many farms, a profit increase of 20 or 25 per cent can be expected after consultations with a computer. Of course not all farmers will experience such an increase, but some may do better. Electronic programming helps put a farmer in more profitable enterprises, also helps him out of losing operations. It forces him to consider each operation on an individual basis, and prevents losing programs from being covered up in a grouping with successful ones.

Cecil Parker, extension farm management specialist for Texas A & M College, says *resource allocation* and *enterprise combination* are among the biggest problems facing farmers today. This simply means how can dollars, acres of land, and labor be divided among crops and livestock units to get greatest profit. He explains:

"How many ways, for example, can a farmer divide 100 acres between just two crops? Obviously, he can split it 50-50, 75-25, 90-10, 99-1, or dozens more ways. It's hard for him to discover the exact breakdown at which his profits would be highest. On the other hand, it's a simple matter for the computer to discover the peak of profits."

The importance of good farm management is being s t r e s s e d more each year by agricultural leaders. John E. Hutchinson, director of Texas Agricultural Extension Service, believes "the rewards for good management have never been greater, nor the penalties for mistakes more severe than they are today." Management, he says, is "now the key to successful farming and ranching."

This is in contrast to by-gone days, when hard manual labor would often offset and overcome poor management. In only a few instances in modern agriculture, Hutchison believes, can the ***hand*** substitute for the ***head***.

More alfalfa dies of starvation than is ever lost due to severely cold winters. Good nutrition can keep alfalfa stands producing at high profit levels over a period of several years. That means adding heavy applications of phosphate-potash fertilizer at the time of seeding and top-dressing old established stands of alfalfa in the fall or spring. Soil tests will indicate how much phosphate and potash the soil needs to maintain money-making yields. —*Fertilizer News*

FARMER'S DIGEST CUTTER-CLEANER-SCRAPER TOOL

Cleans spreader beaters. Scrapes plow and cultivator shovels. Cuts weeds and briars. Opens bales. Cutlery steel head has knife-sharp cutting hook, broad scraping edge. 20" long. Hanger, hardwood handle. Order one from Farmer's Digest, Fort Atkinson, for each tractor. $1.69 each. Two for $3.00.

FARMER'S DIGEST PIG & CALF CASTRATING KIT

With New Castra-Knife, Illustrated Instructions, Lanyard, Extra Blades.

Do your own castrating and do it right. Half a litter or one calf pays for this kit. The new Castra-Knife is a sharp, handy, safe razor-blade cutter. Unlike old type castrators, it is always super sharp for a fast, sanitary, humane job. It is safer for you and the animal because blade sets to limit depth of cut, also retracts and is shielded when not in use.

Authorities say illustrated instructions are best ever prepared covering old scrotal sac operation and new college-approved, simplified ventral incision method. Plastic lanyard cord with swivel suspends knife from clothing to free hands between operations. Saves time and avoids contamination. Kit also includes five extra blades and a plastic case. Order from this ad. Send only $1.29 to Farmer's Digest. Postpaid. Money back guarantee.

ORDER FROM — FARMER'S DIGEST, Fort Atkinson, Wis.

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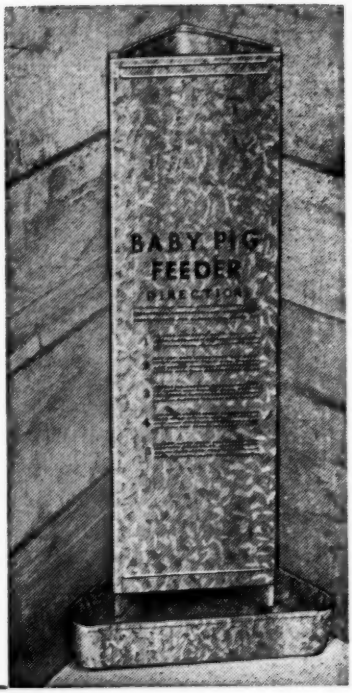

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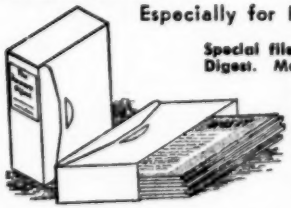

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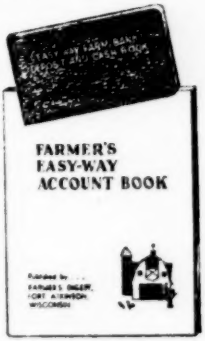

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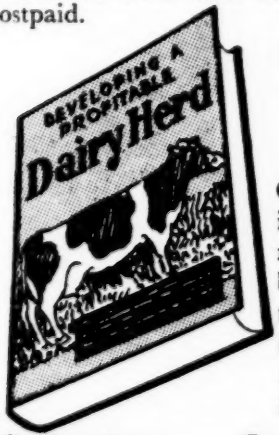

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